Smithsonian

November 1987

The good news about viruses

Using a virus as the vehicle, researcher will infect mouse with beneficial gene like that shown as black arc in DNA map (p. 116)

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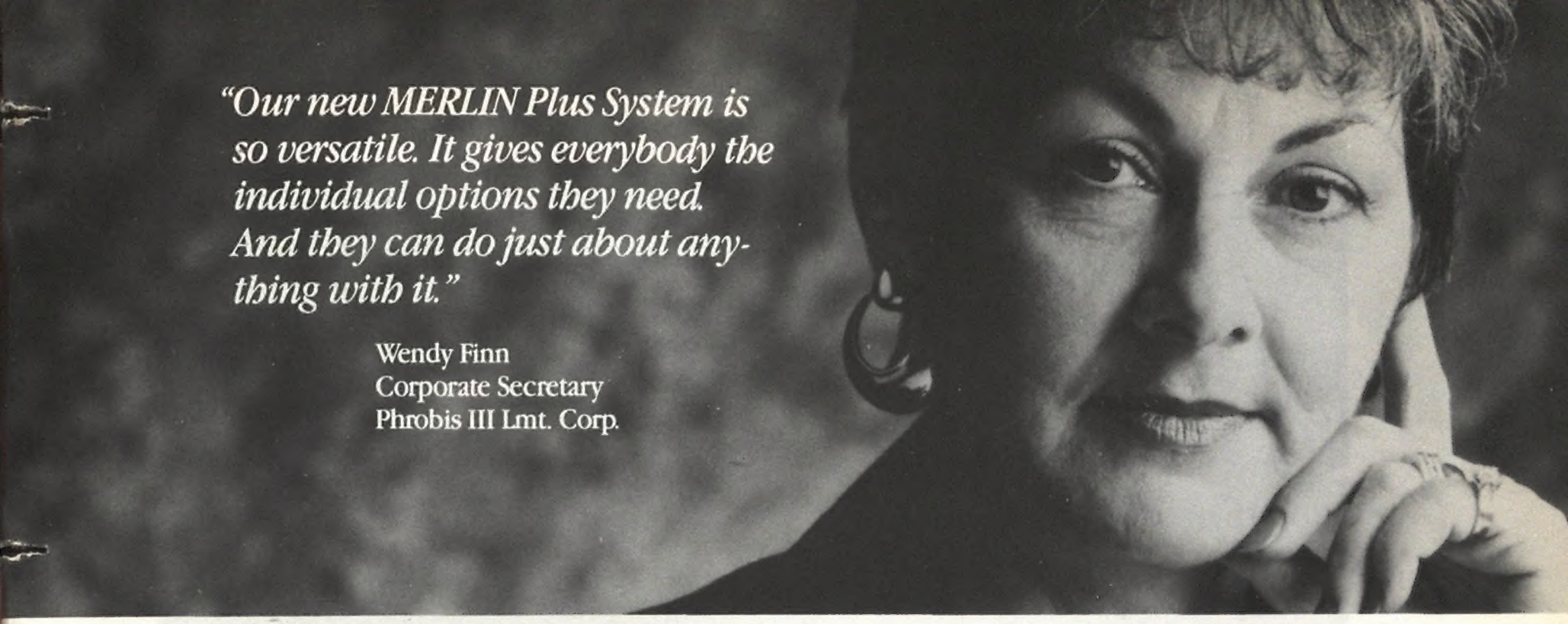
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PARKER

November 1987

Smithsonian

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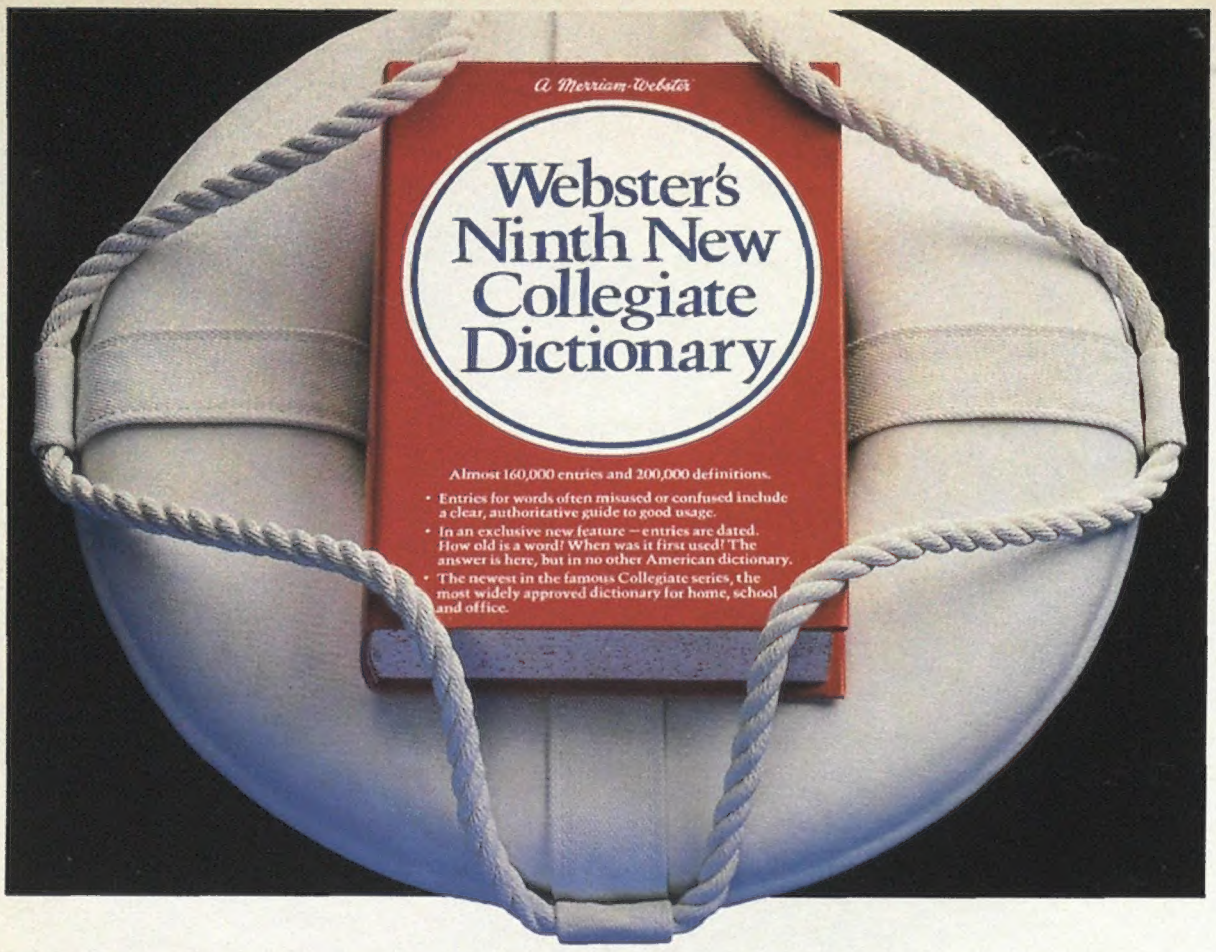
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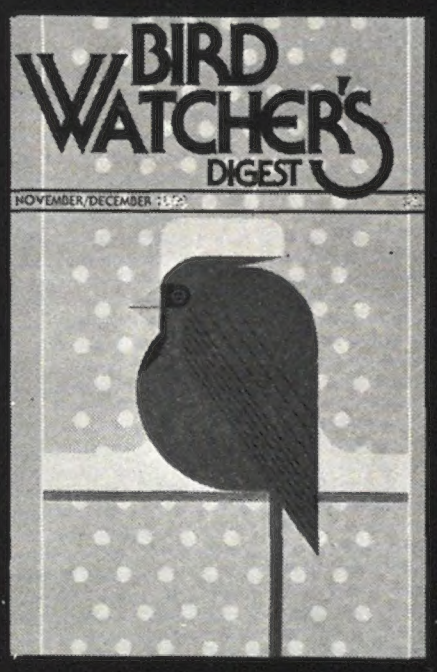

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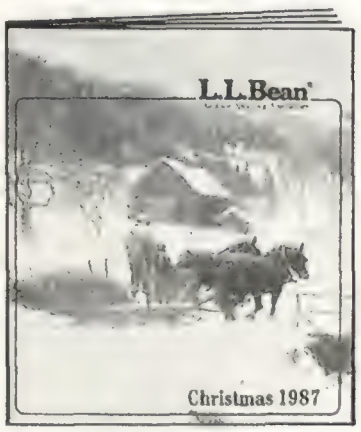

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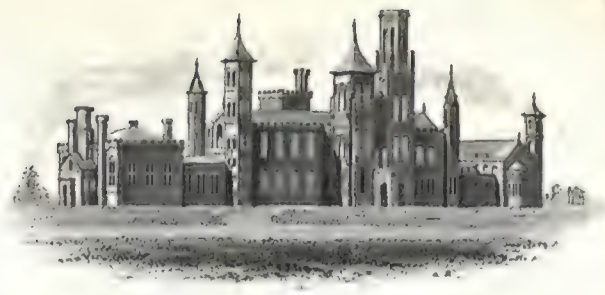
Smithsonian horizons



Recent discussions with Indian leaders have raised questions about repatriation of skeletal remains and sacred objects

The ruins at Puye, on the lands of the Santa Clara Pueblo in northern New Mexico, go back almost 800 years. Densely clustered stone-walled rooms surround a square plaza on the top of a mesa. Other rooms, cut into the nearly vertical bluff, anchored multistoried dwellings on its lower talus apron that have now crumbled away. A plausible estimate is that this was once a substantial town with more than a thousand rooms. It is understandably a hallowed place for the people of Santa Clara.

At the invitation of the pueblo, several of us from the Smithsonian recently joined a number of native American political and religious leaders for a full day of discussions in that lovely setting. Many had come for the Indian Market held annually in nearby Santa Fe, providing a welcome opportunity for wide-ranging exchanges on matters of common interest. Principal among them were rising demands for the repatriation of skeletons and sacred objects, now widely scattered in the world's museums, and for museum exhibits less devoted to static, stereotypical displays of the timeless past and more to the dynamism, diversity and continuing vitality of the native American culture.

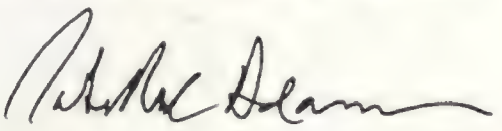
There is no serious question about the need for some repatriation. Unambiguous records of early acquisitions are often lacking, but objects of ritual significance that were common tribal property seldom if ever could have come legitimately into nontribal hands. Similarly, descendants have an unquestionable claim on the remains of their known ancestors, at one time collected in ways that do not always stand scrutiny (*Horizons*, May 1987). Individual circumstances of course vary hugely and need to be carefully researched before action is taken, but there are grounds for at least a partial accommodation.

The difficulties will increase as we go further. Assuming (as is surely implied by the Smithsonian's charter) that scholarly research and public education are valid ends of public policy, how does a line get drawn around either ancestry or sacredness as a preeminent principle? A north Rio Grande pueblo participant spoke out eloquently for the sacredness of the common grinding stones she saw in a museum. She touched them in awe, sang to them, and was troubled in her heart to see male visitors unknowingly handle these important symbols of a female domain. In her view, little could rightly remain in museum collections. An Iroquois speaker, on the other hand, would be content with a much more circumscribed zone of sacredness—one applying only to a small class of objects that still were "important to the integrity of the nation." But promising as this approach is, how and by whom will it be defined?

No less vexing difficulties lie ahead with regard to human remains. Repatriation has been agreed upon where individual identity can be established, and an extension is being strongly pressed for cases in which tribal affinity is reasonably unambiguous. But is Puye ancestral to Santa Clara Pueblo, or did new population elements enter after a hiatus? In most regions other than the Southwest, given the displacements that generally were precipitated by the advancing frontiers, descent as evidenced by continuity of occupation can rarely be established before the most recent century or two.

Awaiting ultimate resolution here are sharply opposed interests. On the one side, Indians with an inclusive sense of their native American ancestry and a deep and growing anger at what is perceived as (and in fact often has been) the differential treatment of excavated Indian remains from those of white settlers. On the other side, physical anthropologists are enabled by new laboratory techniques to date skeletal remains with greatly improving accuracy, to recover antibodies and antigens indicating exposure to diseases and to find direct evidence in bones of major subsistence patterns. "We don't care what our ancestors ate," several speakers insisted at Puye. Yet as the claim of direct ancestry becomes increasingly hard to establish, the contrary claim of scientists gains force that this is the best substitute we will ever have with which to reconstruct what is, after all, part of our common background as a multiethnic nation.

The possibility of bringing the Museum of the American Indian from New York City to the Mall in Washington was woven into the fabric of our discussions. Senator Daniel Inouye's initiative toward this end has been warmly endorsed by the National Congress of American Indians. If this happens, the Smithsonian will become the center not just of an ongoing dialogue like that at Puye, but also of extensive training programs and new forms of outreach. And both these concerns of American Indians and their ill-recognized but extraordinary achievements would receive new, richly deserved attention, not only from Washington's vast museum-going stream of visitors, but from some hundreds of near neighbors on a well-known Hill to the east.



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"Testing one, two, three."

This is an experimental computer system that turns words that are spoken into words that are seen.

It's a speech recognition system being developed by IBM research, and it's the most innovative one of its kind.

In fact, the device you see here performs up to 30 million calculations to decipher a single word. It understands over 20,000 words. It adjusts to different accents. It even distinguishes between words that sound alike

but have different meanings, such as two, to and too. So you can dash off a letter, write a report, even try your hand at the great American novel–by speaking into a microphone.

Right now this technology is still experimental. But someday, it could make using a computer as easy as one, two, three. And you can't say enough about innovation like that.

This speech recognition system is a research project and can not be purchased. For more information write: IBM Communications, T.J. Watson Research Ctr., P.O. Box 218, Yorktown Hgts., NY 10598.

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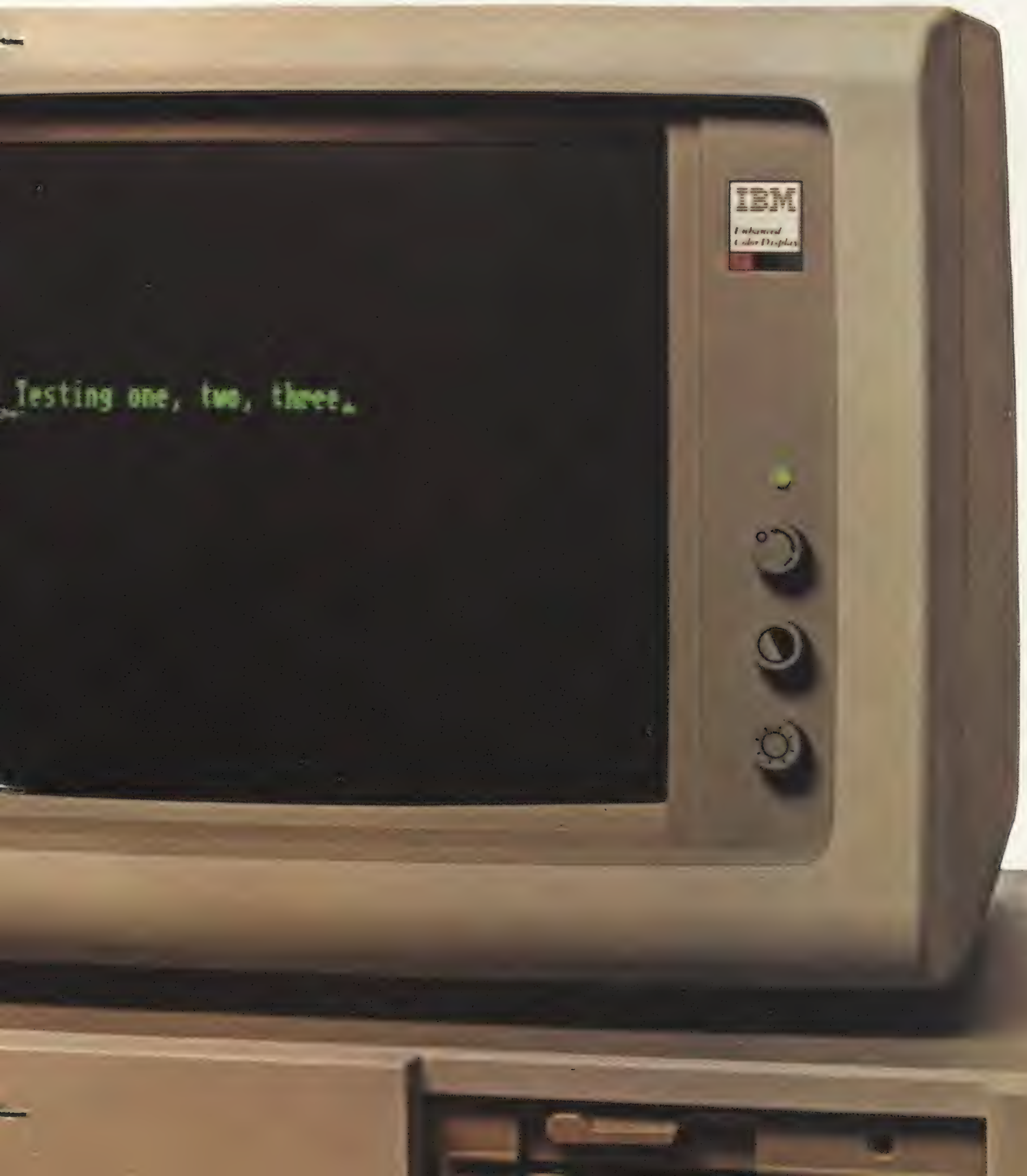

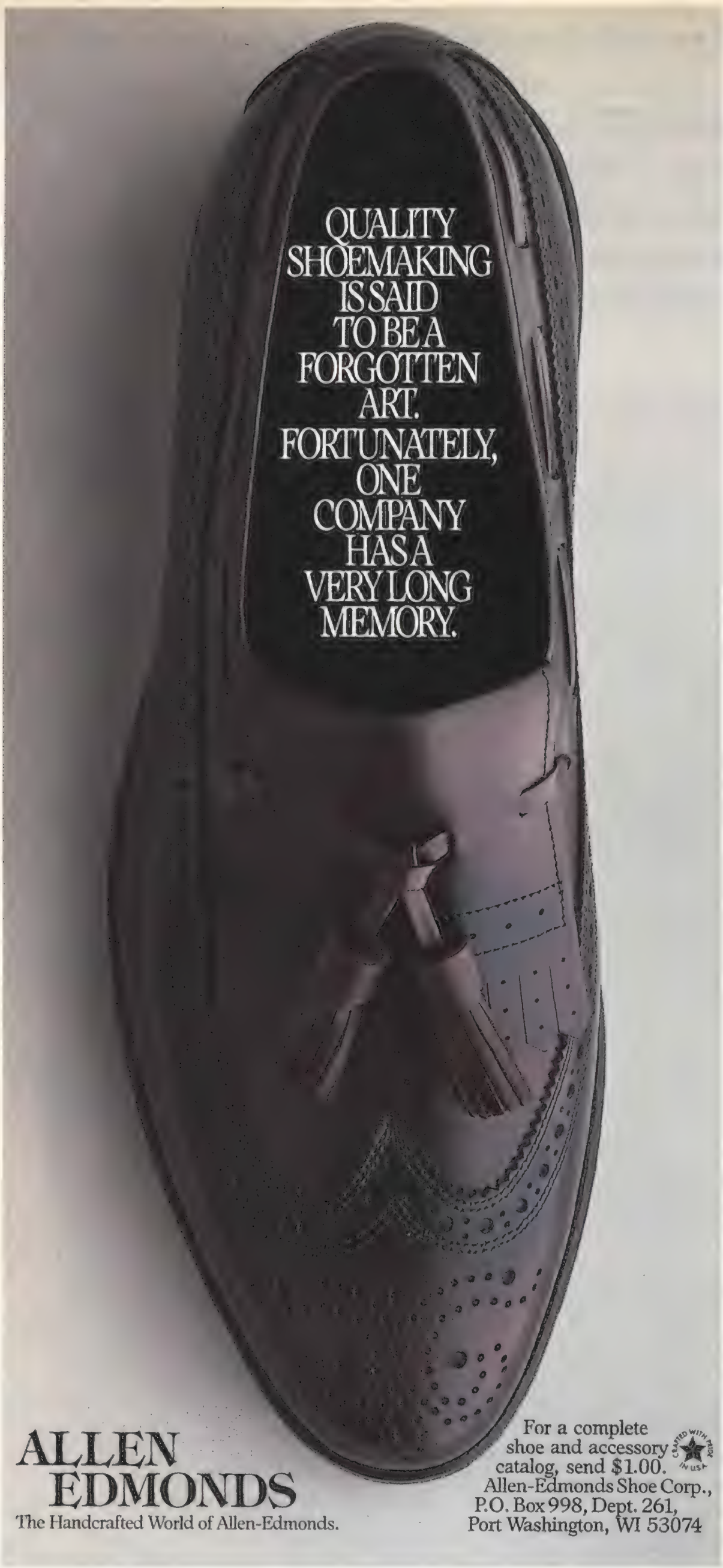

Letters to the Editor

The Smithsonian's new museums

Dear Sir: I was amazed at your preoccupation, in the September issue, with being underground. Recently I spent a week showing a 10-year-old the wonders of the Smithsonian Institution's collections, and we could not tell if we were under or above ground most of the time. We were too interested in what was around the corner or in the next display case to wonder about our outside environment. I look forward to exploring the two new museums and doubt the basement arrangement will even be noticeable.
Michele Webb
Fort Belvoir, Virginia

Dear Sir: The "price of respect for age," the sum spent to save the South Yard's old linden, did not amount to $850,000—the estimated cost to protect the tree in *initial* plans for the new museum complex. The original design was for a larger building that totally surrounded the tree's roots, which were to be contained inside a cylindrical vessel. Our venerable linden likely would not have survived the ordeal. Instead, the design was modified so that the corner of the complex near the tree was built to skirt the linden's roots. Before and during construction, the Office of Horticulture spent approximately $12,000 on special measures to feed, water and protect the tree.
James R. Buckler, Director
Smithsonian Office of Horticulture

Rhinos in Nepal

Dear Sir: It sounds as though Mishra and Dinerstein had their work cut out for them if they really moved 15,000 *tons* of

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one-horned rhinos to the Bardia reserve.
George E. Stevens
Alexandria, Virginia
And so they would have. It should have read pounds. Ed.

Caltech

Dear Sir: I am an applied mathematics major at Caltech's rival, Harvey Mudd. As to the picture of the unicyclist, Mudd—about ten minutes east of Caltech on the 210 freeway—has its Gonzo Unicycle Madness Club. In fact, certain faculty members have been known to boast to incoming students that we have more unis than any other college in the whole United States. Also, Caltech students can be very naive at times—ask them how Mudd students stole their cannon right out from under their noses by posing as land surveyors.
Brian P. Evans
Claremont, California

Dear Sir: Disparaging remarks about the Battling Beavers do not accurately portray a football team that has won all but five games in the past four years, including 17 consecutive victories. Some of our more lustrous opponents include local powerhouses: La Verne College, Cal Poly-Pomona and Azusa Pacific.

The team received nationwide media coverage last season on the *CBS Evening News with Dan Rather*, and this season in the college football issue of *Sports Illustrated*. The *Los Angeles Times* also provides regular local coverage. The notoriety of the Caltech football team is due solely to its athletic and academic achievements, as opposed to drug scandals, recruiting violations or stadium litigation, which appears to be the case for other, better-known football teams.
Fred Burnette, Daren Casey, Michele Vogt
Jet Propulsion Lab
Pasadena

Dear Sir: In 1943, I was sent to Caltech by the Army for 44 weeks of intensive training in meteorology. I was told that in the earlier days someone wrote on a construction crane "Jesus Saves," to which someone had added "But Dr. Millikan takes credit for it."
John W. Wood
Tyler, Texas

Dear Sir: You're calling the Pasadena Police, and I quote, "lackluster"? Hey! They're a fine bunch of people, with as much glamour, glitter and pizzazz as any Hollywood critters! And they field a good football team. The streets of Pasadena are not all roses by any means. So please don't call our cops "lackluster"; instead you say, "Hello sir, buddy, pal."
E.J. Cotts
Pasadena

Dear Sir: I was pleased to learn that, while Caltech may dwarf my alma mater on matters scientific, U.C. Santa Barbara was 20 years ahead in at least one area: unicycling. It was my only mode of transportation, other than my feet, while on campus my freshman year, 1967-68. I still have a unicycle and can still manage to get around on it.
Christy Huddle
Rockville, Maryland

Dear Sir: The 60 percent of Caltech's graduates who "join the legions of new graduates who simply wing it" includes a former apprentice Hollywood film editor. In June 1918, a young Sicilian

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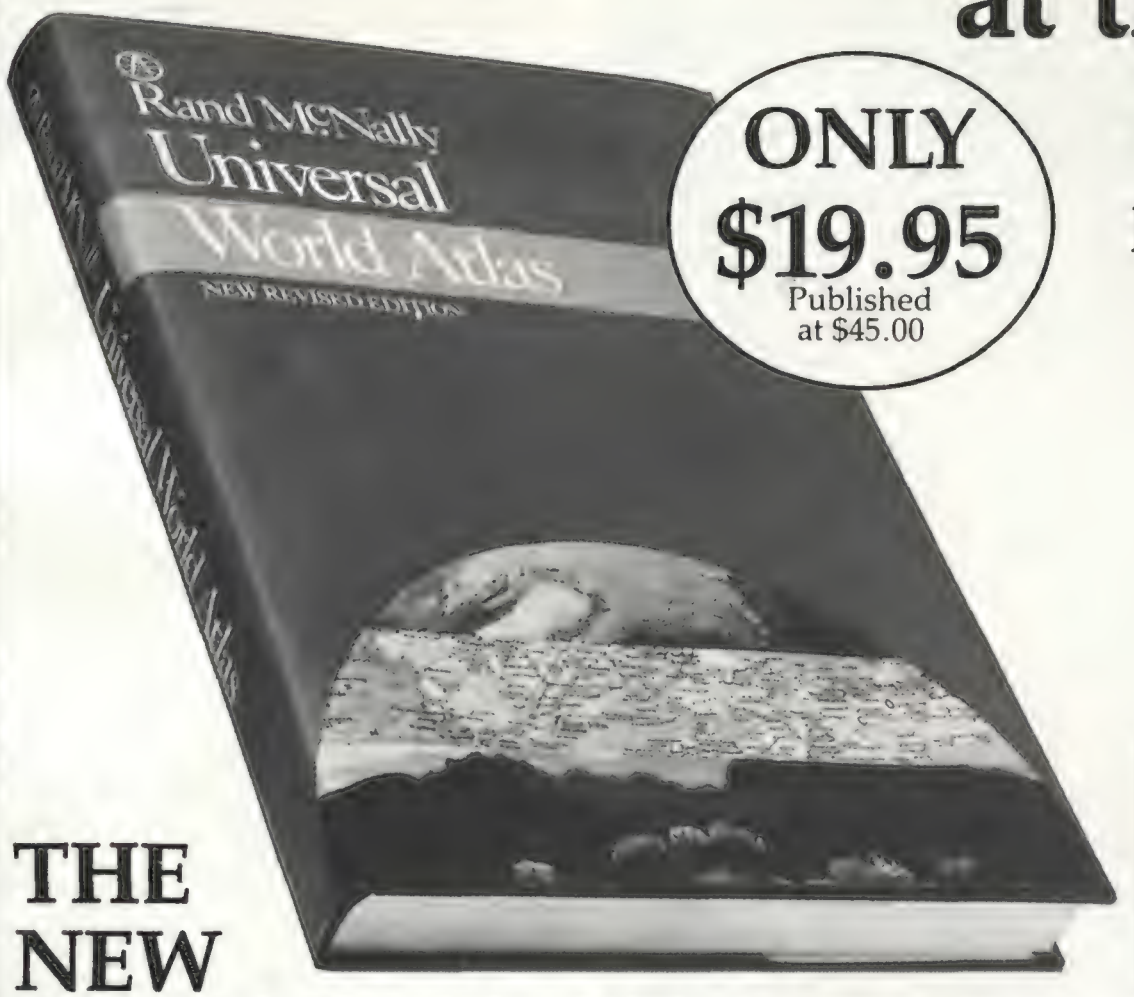

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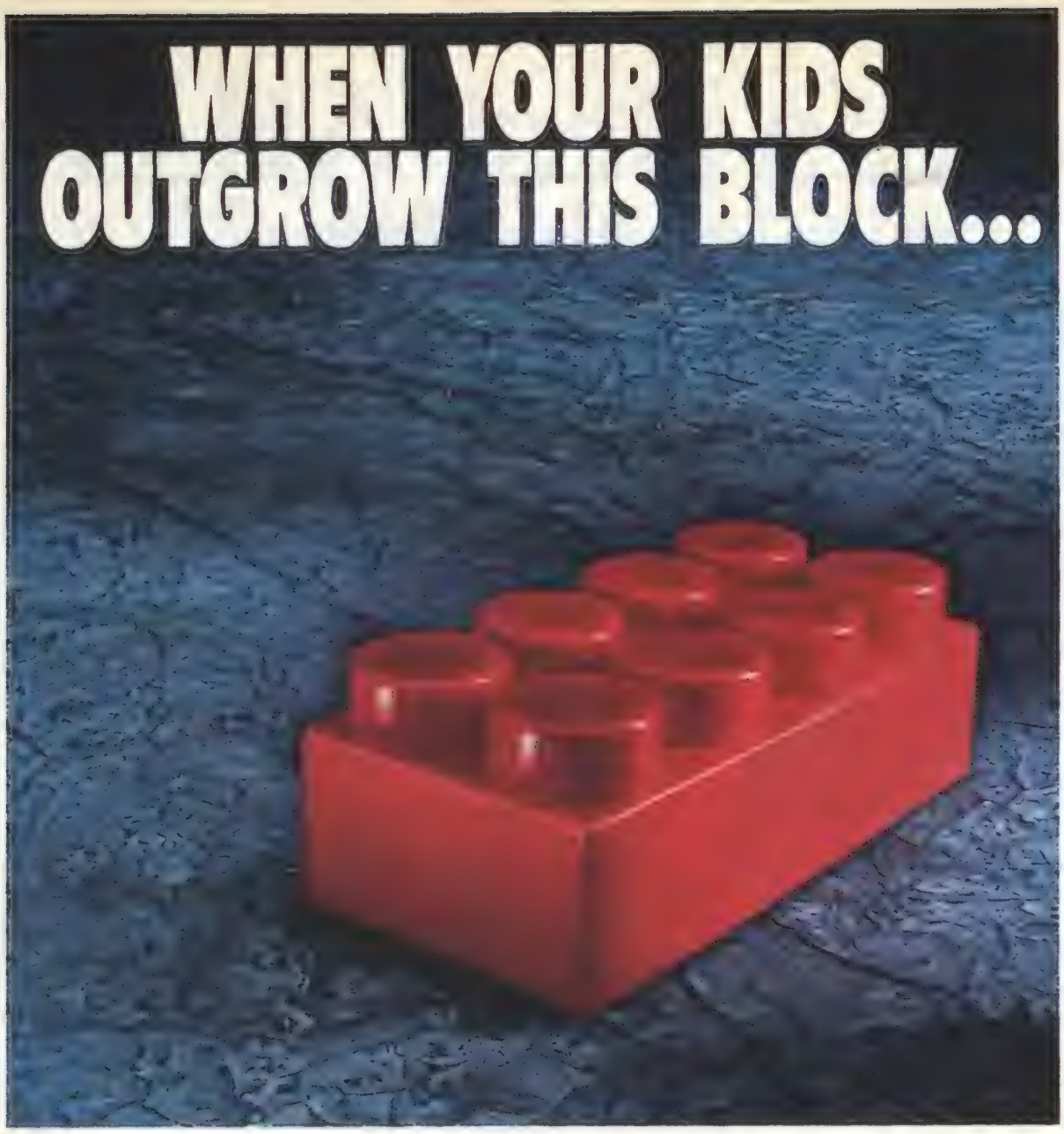

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immigrant graduated from Caltech with a degree in chemical engineering. He subsequently landed a job in Hollywood as a film cutter and went on to some success. His name is Frank Capra.
Andy Eiseman
Englewood, Colorado

James Madison

Dear Sir: One of the many points omitted from Mr. Foote's article was Madison's efforts in securing the Louisiana Purchase. The credit rightfully belongs to Jefferson, of course, but much of the success of the negotiations for the purchase can be attributed to his Secretary of State, Madison.
Richard G. Simon
San Bernardino, California

Dear Sir: I was surprised that Timothy Foote dismissed Kitty Floyd as the daughter of a "politician." Her father was a signer of the Declaration of Independence—William Floyd of Long Island. I think I hold men of such caliber a cut above politician. Kitty married the Rev. William Clarkson, M.D., on August 2, 1785. He was a member of a prominent and distinguished family of Philadelphia. They were my great-great-great grandparents.
Janet L.M. Parry
Lake George, New York

Dear Sir: Mr. Foote's article brought home a recurring problem concerning the First Amendment. The constant use of the phrase "separation of Church and State" has led to the misconception that the phrase is used in the Constitution. On the subject of religion, the First Amendment has only this to say: "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof. . . ."
Rita Watson
Clyde, Texas

Dear Sir: I complain about describing Dolley Madison as "buxom" at the time of her marriage to Madison. Our local museum boasts a dress in the Empire style that belonged to Dolley after she turned her back on her Quaker upbringing and her first marriage. Its measurements are the envy of many a present-day dieter.
Frank A. Masters
Greensboro, North Carolina
Always remember, one man's buxom is another man's svelte. Ed.

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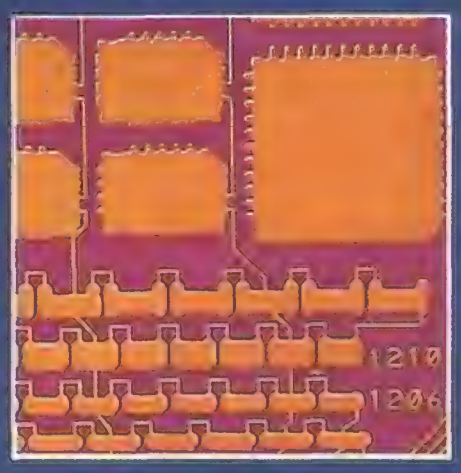

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Harvey Girls

Dear Sir: As an 87-years-young railroad man, covering most of the Southeast back when riding the rails was the way to go, I am sending you a menu taken from my railroad scrapbook. It is from the Fred Harvey dining car Coronado, that left Chicago, Friday, March 15, 1889, and included bluepoints on half-shell, boiled fresh salmon with shrimp sauce, boiled ox tongue with sauce piquante, roast beef au jus, loin of veal stuffed, asparagus on toast, sweetbreads, petit pois, queen fritters with Madeira sauce, roast lamb with mint sauce, fresh lobsters, apple pie à la mode, rice pudding with vanilla sauce, assorted fruits, Batger's orange jelly, New York ice cream, Edam and Roquefort cheeses, French coffee. And the price: 75 cents! Ah, smoke gets in your eyes.

Martin Hullender
Charlotte, North Carolina

Sailors of the Fourth Coast

Dear Sir: Even an old land-bound Californian like me knows that we're looking at the bow of the *Star* on page 125, not the stern.

Donald F. Johnson
Kelseyville, California

We bow to Mr. Johnson. Ed.

Shakespeare

Dear Sir: Here we go yet again, with the anybody-but-Shakespeare-wrote-Shakespeare stuff.

What really bugs these oddball fellows and ladies is that of all British poets, the greatest of them—Shakespeare—never went to college.

Milton, in his homage to Shakespeare, refers to Ben Jonson's "learned" comedies. They are learned, but they are also dead as a doornail. But nobody has a good explanation of how Ben Jonson got fooled into thinking that his colleague Shakespeare wrote Shakespeare. He said, in the preface to the First Folio, that Shakespeare "had small Latin and less Greek." That was perfectly true.

All of Shakespeare's plays about Greece and Rome are based solely on North's English translation of *Plutarch's Lives.* We know that, because it is such a very bad translation. Sir Thomas North didn't translate from the Greek; he translated (very freely) from a bad French translation. Many passages (as, for example, in *Anthony and Cleopatra*) contain ver-

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Norm Thompson

batim quotes from North of stuff that isn't in Plutarch at all. One would suppose that an "educated" Elizabethan would have quoted Plutarch from the original.

Of course you can't even begin to explain the genius of Shakespeare. Or that of Isaac Newton or Albert Einstein or Wolfgang Amadeus Mozart. But that certainly doesn't mean that a genius must be an impostor.

Albert M. Freiberg
Cincinnati

Dear Sir: How did an Englishman who "sailed his own ship in the Spanish Armada" retain not only his head but the good graces of his Queen?

Harold Clark
Fanwood, New Jersey

Easily—by sailing against *the Armada*. Ed.

Dear Sir: The thrust of Ogburn's book as reported by you—that Will of Avon was too plebeian for the task—is unacceptable. The great distinction of the plays is their thorough understanding of human nature.

More plausible to me is the theory that the plays were written by the great Christopher Marlowe, a theory excitingly developed by Calvin Hoffman in his book *The Murder of the Man Who Was Shakespeare*. In it he postulates that Marlowe, whose run-ins with the law were about to come to a head in 1593, faked his death and escaped to Europe. Coincidences are remarkable and many.

While I would agree with Ogburn that a high degree of literacy is evident in the language of the plays, such literacy is more likely to be found in a practicing writer than in a dilettantish member of the aristocracy.

Mrs. Lyda N. Rochmis
Reston, Virginia

Dear Sir: I would like to add my own suggestion that these plays were really written by Alfred Hitchcock. A prolific storyteller, he could work in comedy, tragedy or history with equal ease. Looking deeply into the human psyche, he did not have to be a member of the aristocracy to understand nobility, nor did he have to be a world traveler to understand the past. He could recycle a story and put his own mark upon it without having actually "been there." As for the code "Bacon Is" that some scholars have "discovered," proving beyond doubt that Francis Bacon really wrote the plays, this too bears Hitchcock's inventiveness.

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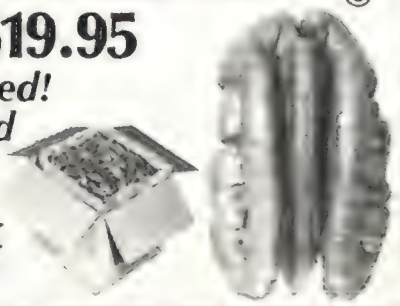

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The only problem that remains is: Who is the joker taking credit for being the Bard before Hitchcock was born?
June Fine
Newton Highlands, Massachusetts

Dear Sir: Two central points: there is simply *no* evidence that anyone but Shakespeare wrote the plays—all is speculation. And the factual evidence that Shakespeare *did* write the plays is overwhelming. It is simply inconceivable that no rumors, stories, gossip have come down to us from Shakespeare's time about who wrote the plays—the silliness about authorship did not erupt until about 200 years after Shakespeare's death.
Edward C. Sampson
Killingworth, Connecticut

Dear Sir: William Shakespeare is a pen name; from the numerous times it was hyphenated during the 1600s it may be argued that it was recognized as such. But the question is: Who used that *nom de plume*?

The man from Stratford-upon-Avon was christened SHAKSPERE; he endorsed his will three times, twice as SHAKSPERE and once as SHAKSPEARE; on other occasions he used variations of these.

The man from Stratford's father and mother could not sign their names, his wife could not sign her name and his younger daughter, Judith, could not sign her name.

Shakespeare fails to mention his plays in his will, there is no mention of any books, publications, personal papers or any item from a person who was supposed to have been an actor, theater manager and author.
Phillip Proulx, Treasurer
Shakespeare Oxford Society
Arlington, Virginia
Spelling at the time was erratic and often varied. Also, Shakespeare used the Secretary form of handwriting, quite different from the Italic, from which our modern hand evolved and one that can lead to confusion when interpreting hands of the period. In the 17th century it was customary to include personal effects in an inventory after death rather than in a will, but no such inventory of Shakespeare's estate is known. Ed.

Dear Sir: Shakespeare's plays are a constant presentation of the kind of open society that allowed a Prince Hal *(Henry IV, Part I)* to hobnob with the lower classes. The plays have characters from the whole social spectrum and provide scenes that appeal to its entirety.

Parallels between the Elizabethan open society and that of classical Greece are relevant. In Athens, too, the lifestyles and political workings at the seats of wealth and power were known to Greek dramatists, as in Shakespeare's London.
Addison Bray
New York City

Smokestacks

Dear Sir: During the summer of 1964, we rented a 30-acre island in Lake Nipissing, perhaps 60 miles due east of Sudbury. The owner offered us the cottage and island for $3,000. We felt, even in 1964, that this was a steal. But while the water appeared just as clear as on an earlier visit in 1934, there were no fish.

On the outskirts of Sudbury, we had noted a loss of vegetation; all the boulders had a "burned" look, as if there had been a terrible fire. In Sudbury things appeared even worse. We visited the area engineer's office and asked about what we had seen. We were told large copper deposits had been found and that the smelters were doing the damage. We asked, "How do you protect the paint on your vehicles, or worse, how do you protect your lungs?" His response was along the lines of "Who will complain, everyone works for the company." We did not buy the property.
A.C. White
Lt. Col., U.S. Army (Ret.)
Woods Cross Roads, Virginia

Dear Sir: Count von Rumford, noted for his chimney design, is still well known in Germany. As a general at the Royal Bavarian Court, he devised a scheme to feed starving people by mass-producing cheap soups. He was of the opinion that one could throw anything into the pressure cooker—bones, scraps, rotten food—and high temperature would transmute the inferior ingredients into quality food. But the poor refused to eat the concoction. The well-meaning Count was laughed at, his picture appeared in cartoons, and only the fact that he was the builder of the famous English Garden in Munich, a beautiful park that still exists today in all its glory, saved his reputation from total obloquy.

The memory of this experiment remains so vivid that even today in Berlin, any dish consisting of several different ingredients cooked in one pot is still called *Rumfutsch.*
H. John Bessunger
Hampton Bays, New York

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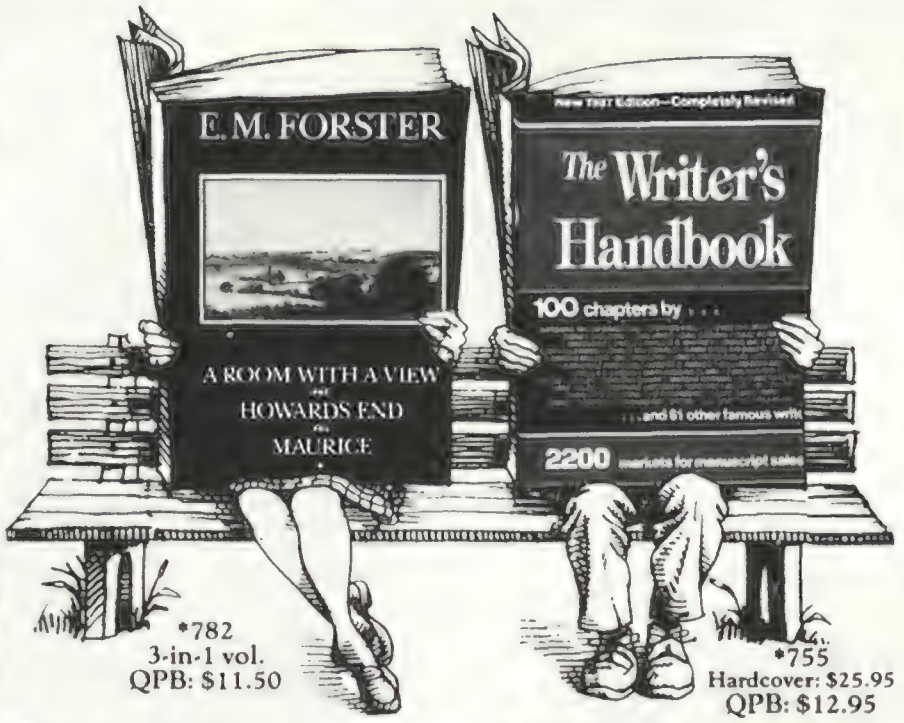
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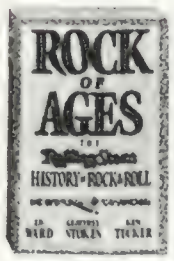

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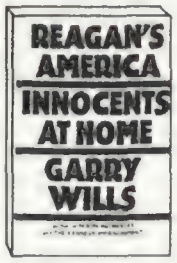

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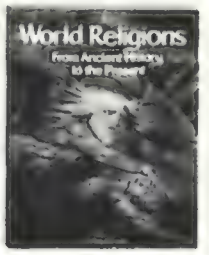

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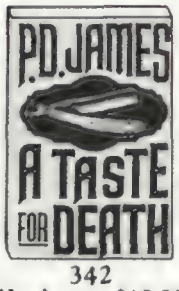

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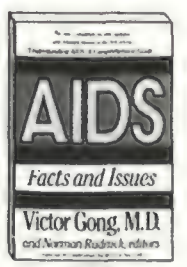

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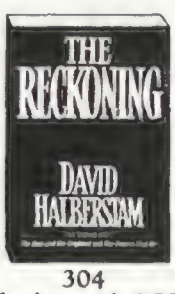

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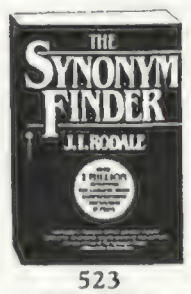

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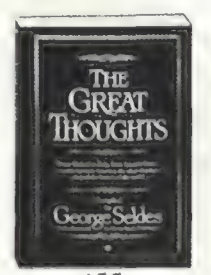

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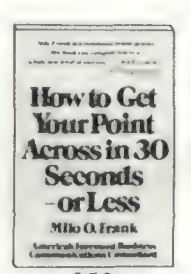

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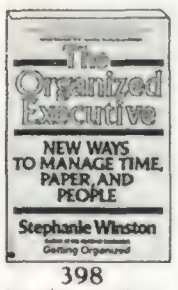

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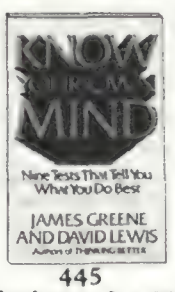

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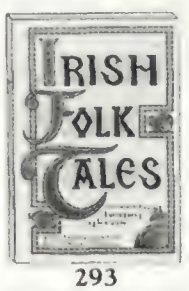

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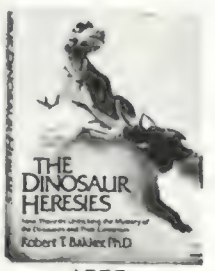

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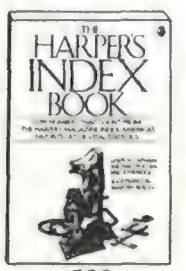

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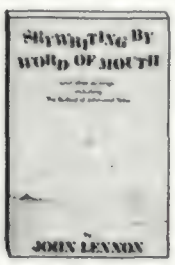

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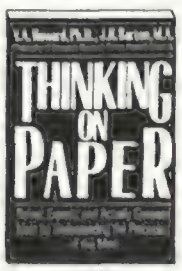

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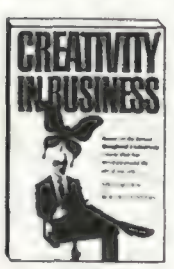

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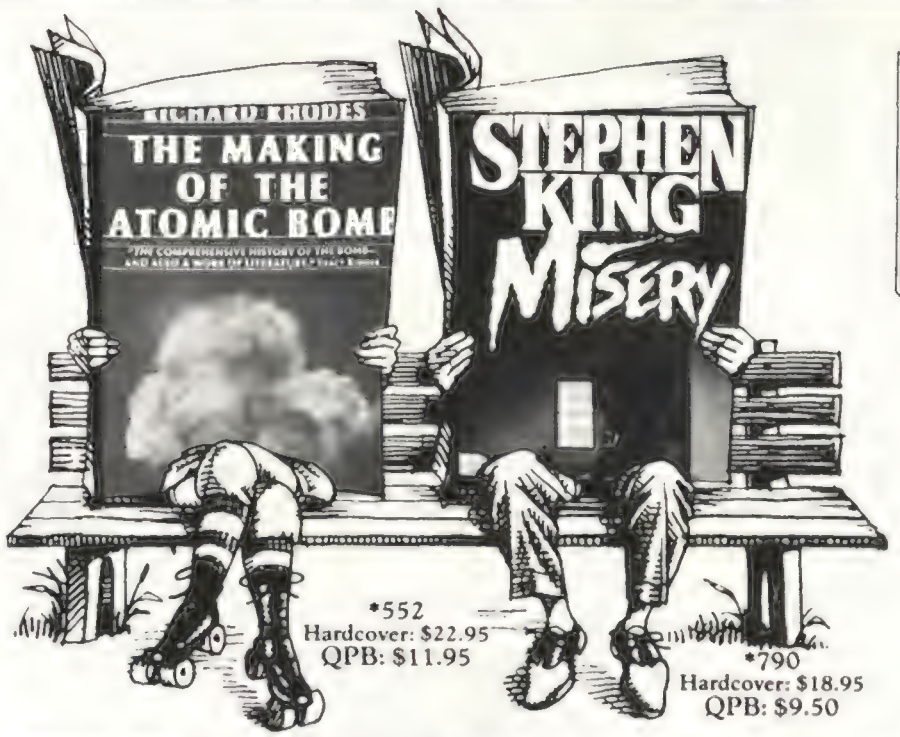

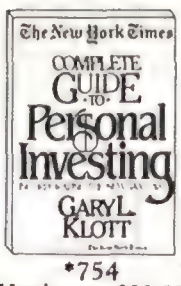

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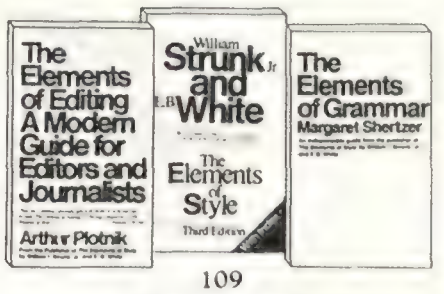

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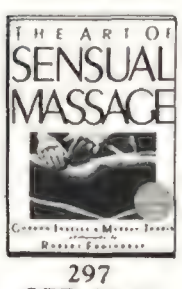

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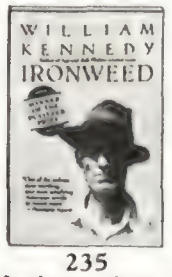

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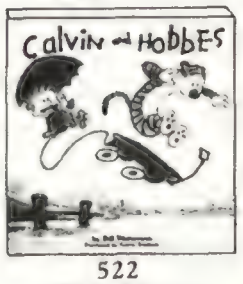

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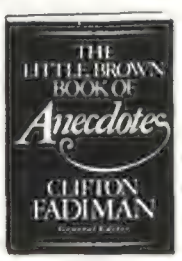

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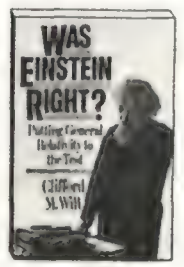

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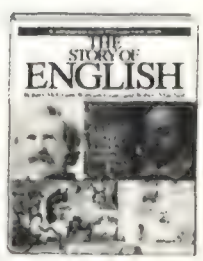

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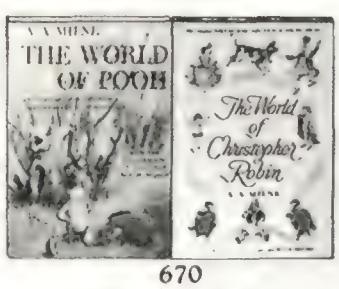

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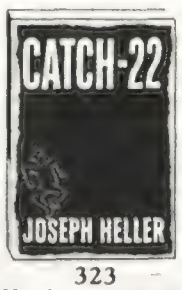

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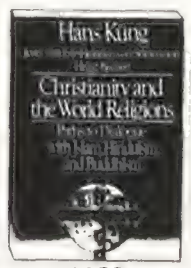

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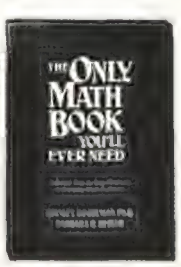

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Around the Mall and beyond

This is an inside story about this very magazine—a project that was dreamed up as a small spin-off, and that grew like Topsy, all because of the tendency of humans to look at certain animals and see themselves. The project actually started not with animals, but with the Supreme Court, which, generally speaking, is pretty far afield of natural history.

Ten years ago, SMITHSONIAN ran a wraparound cover of the nine Justices, posing informally. It illustrated a two-part article that my old colleague Dick Williams had written, and Publisher Joseph J. Bonsignore thought it might be interesting to make a poster of it and try marketing it. "I'll bet every lawyer will want one for his office," said Joe, who is known around here as an irrepressible enthusiast.

We printed 5,000 posters of the Justices, and Joe put our present production director, Cherry Doyle, in charge of the project. "I don't know how many lawyers bought the poster," Cherry told me, thinking back, "but we had orders from what seemed like every jail you ever heard of."

Apparently, a lot of ambitious American convicts saw the chance to make a personal pitch and, working pretty much alone, Cherry was able to fulfill their orders. "The sales weren't great," she recalls, "but we got rid of the printing, and I know the ZIP Code of every prison in the country."

Not so long after, this magazine ran an article about preserving tigers. One picture—many readers will remember it—showed a tiger lying on his back with his paws curled comfortably above his obviously full belly. The lolling feline tickled all of us on the staff. We penned appropriate captions on the proof when it was tacked up in the layout room: "The office? For me? Tell 'em I'm sick." And "I can't believe I ate the whole thing!" We did this surreptitiously because when you work at the Smithsonian you quickly learn that anything even vaguely hinting at the anthropomorphic is a no-no.

Joe Bonsignore has vast experience with publications, illustrations and the tastes of readers. He felt, as we all did, that the tiger had a far more universal appeal than the Justices of the Supreme Court. We don't associate easily with famous jurists, but who hasn't felt, after Thanksgiving dinner, exactly the way that sated tiger looked?

Is this being anthropomorphic? "Well," says Joe, thinking back, "that was in the eye of the beholder. At least we didn't put little overalls on our animal the way the illustrator of the Thornton Burgess bedtime stories did."

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For additional stores, write: Cole·Haan, Dept. N11, North Elm St., Yarmouth, ME 04096.

Cherry Doyle has seen the poster project through from lions to meerkats.

Joe felt we might just possibly sell them. We put a small ad in the magazine.

"I came back from a long weekend," Cherry recalled, "and could barely get into my office because it was jammed with No. 2 mail sacks. No. 2 is a big one. There must have been half a dozen of them, completely filled with money and orders for the tiger poster. I got friends—really good friends like Mary Ellen Bobb, the magazine's business manager—to help on weekends, rolling posters, addressing labels, all that. I learned all about the requirements for third-class mail. We worked and worked, and the orders kept coming."

The tiger poster was a smash hit—40,000 were sold—and a panda picture from a Chinese source also did very well. But the photograph of a mother tern and her nestling wasn't such a hot item. And the bobcat kitten was all right, but no world-beater.

Then came the meerkats. The story about these strange little African mammals, closely related to mongooses, appeared in the magazine in April 1986. David Macdonald, a British biologist, had been studying them in the Kalahari Desert because of their extraordinary group behavior. Vulnerable because of their size, they prosper by cooperating with one another. They stand watch in turn; they tend each other's young; they

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drive away much larger predators by aggressively presenting a solid front. Do I need to go on? Of course not, because judging from the reader reaction to the meerkat poster that we offered in a magazine ad, everybody read the story and fell helplessly in love with the gregarious little critters.

Everyone on the staff realized that the meerkat photographs had a special appeal, and one group picture of nine of them, standing together, seemed to be destined to make the cover of the magazine. Then someone recalled that we'd had a lot of natural history covers lately and that we ought to do another subject. The nine meerkats lost out.

"They'd make a poster," said the poster people. And in no time the ad was out with a caption proudly supplied by Joe Bonsignore: "We almost made the cover of SMITHSONIAN."

The reaction has been overwhelming. I was shown a sampling of letters that have been coming in with orders for the meerkat poster and there's no question but that nine meerkats have it all over nine Supreme Court Justices. Many letters reflect similar reactions: delight with the meerkat story and pictures; appreciation for our magazine in general. We would like to thank the readers for those unsolicited words of praise, even though quite a few such statements were tempered with a gentle twitting about our editorial insanity in not using the meerkats on that cover.

Caption suggestions are rife. "We're going to use it as a safety/pay-attention-to-what-you're-doing message with the caption—BE ALERT! (THE WORLD NEEDS MORE LERTS)," says a woman from Oklahoma. "Where did Mom go?" comes from Peoria, Illinois. "Synaxis of the Desert Fathers" is the offering of a rector from Texas.

Elaine Ouellette, who is handling the poster orders now, remembers many more in the order forms: "Are you sure you parked the car over here?" "Don't worry about Martha. She'll be along any minute." And from college students close to registration day, "What line am I supposed to be in for Economics 101?"

So many people saw a resemblance between the group and their own various office staffs that it makes you wonder if meerkats are responsible for our gross national product. "Reminds us of Jim's law firm," says one letter; "I've seen crowded elevators like that in the Fed-

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eral Building where I worked for ten years," comments another; "It could be a portrait of one of our board of directors meetings," says a third. And an airline agent writes, "Believe me, that look is universal!"

Sometimes the poster alone just isn't enough. "What I really would like is a live Meerkat!" declares a woman from Dallas. We can't help her, but our cottage industry has gotten itself into the meerkat-T-shirt-and-coffee-mug game, and business is booming. Readers now ask for meerkat dolls, cards, trinkets, and Cherry recently pondered meerkat designer jeans. Of these, only the meerkat dolls are actually being produced. They will be available in the Museum Shops shortly after Christmas, and will appear in the Smithsonian spring catalog.

The newest poster in the works shows a pair of three-toed tree sloths (try saying that fast) basking in the sun. And someday Joe Bonsignore and Editor Don Moser want to do a poster of the red uakari monkey (below) that glowers from the November 1981 article about David Attenborough's TV series *Life on Earth*. As Joe points out, this curmudgeonly red-faced simian is the very picture of a misanthrope. Joe has his own caption all ready for it:

"So I forgot our anniversary. So what?"

Another might be, "Whaddya mean, you're out of meerkat posters?"

Edwards Park

Red uakari monkey's glower offers myriad anthropomorphic interpretations.

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American Airlines thinks enough is enough.

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We strongly urge other airlines to follow our lead.

Keeping schedules on schedule.

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We can't control the Air Traffic Control system.

While we're doing everything in our power to reduce the number of flight delays, there is one important factor over which we have little control. The Air Traffic Control system.

Today there are 1.1 million more flights annually than there were three years ago. Unfortunately, the Air Traffic Control system has not grown fast enough to efficiently handle the increased number of flights. This has resulted in a record number of flight delays.

The Department of Transportation agrees.

The Department of Transportation has also decided that enough is enough.

It has recently announced a decision to invest heavily in upgrading the Air Traffic Control system with more controllers and new, updated equipment.

American Airlines applauds its efforts. But, since these changes can't take effect immediately, we are going to have air traffic delays for some time to come.

Dedicated to the proposition that your time is of the essence.

At American Airlines, we're working harder than ever to keep our schedules on schedule. Day in, day out.

We know how important your time is.

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t Seem Like Flight Is Late?

Phenomena, comment and notes

Intrepid filmmaker braves Greenland ice cap with an expedition searching for mysterious fifth force of the Universe

I've walked on water only twice. The first time was in the Bahamas, where underwater shoals rise almost to the surface. I dropped anchor in about a foot of water and stepped out. The sun was hot and bright as I walked around on top of the ocean; an island was just barely visible on the horizon.

The second time was last summer on the Greenland ice cap, when I realized there was a mile and a half of frozen water, moving slowly, beneath me. This time the only thing visible against the white-on-white horizon was DYE 3, an eight-legged DEW (distant early warning) line radar installation, standing like a giant mechanical spider in the sun. I was here with a team of scientists to look for the fifth force of the Universe.

This hypothetical force, so far undetected, has been described in more sensationalistic journals as antigravity, but the reality may be less exciting. What the scientists are looking for is some unknown force that somehow affects gravity, possibly by strengthening it as well as by weakening it. Finding this force entails making the most accurate possible measurements of gravity to see if its strength ever varies from what theory predicts. It is somewhat analogous to making careful measurements of planetary orbits to see if they depart from their expected paths, a perturbation that could be explained by a more distant, unknown planet.

We had come to Greenland to make measurements across and through the largest slab of uniform composition we could find: the ice sheet. It seemed fitting, as the original experiments that ultimately triggered our expedition had been conducted on a frozen lake by a Hungarian physicist around the turn of the century. Baron Roland von Eötvös worked only in winter, when he could walk out on the ice to where he had isolated his instruments as far as possible from known concentrations of mass that would compromise his readings.

Einstein used Eötvös' gravity measurements in developing his general theory of relativity, but 64 years after the Hungarian's last paper was published, Ephraim Fischbach and a team at Purdue University reexamined Eötvös' data and announced that the figures showed a deviation from the expected. Some other, unknown force could be at work. They called it hypercharge and speculated that it acted on different materials with varying degrees of strength, depending on the numbers of nucleons

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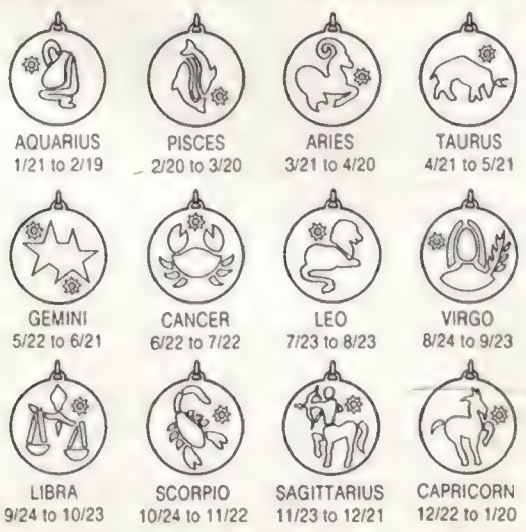
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On Greenland ice cap, scientists check instrument locations;
radar station is on the horizon, entrance to buried dome is at left.

in the atoms of the elements involved. Contrary to Galileo's assertions on gravitational acceleration, the Fischbach group's analysis indicates that, in a perfect vacuum, a feather perhaps could fall slightly faster than a rock.

Their paper made the front page of the *New York Times*. Until now our standard theories of gravity have worked just fine. Stars and planets follow exactly the laws first enunciated by Newton. Experiments between small masses in the laboratory give the same results. It is the gravitational force that we first studied and defined. Since the days of Newton, we have also worked out an understanding of the other three forces in the Universe: the electromagnetic, the basis of electricity, magnetism and all radiation from radio waves and visible light to gamma and x rays; and the strong and weak forces, which act within atomic nuclei. Now, out of the blue, we are faced with a possible fifth force. The two atomic forces have effective ranges no larger than the nuclei they inhabit. Electromagnetism and gravity reach to infinity, although weakening rapidly with distance. The new force, never measured at the planetary or the laboratory scale, is said to be possibly measurable only at an intermediate range, on what might be called a geological scale.

Many scientists thought the existence of a fifth force so unlikely that it was not worth bothering with. Others decided to find out. Mark Ander, a geophysicist from Los Alamos National Laboratory, and Mark Zumberge, of the Scripps Institution of Oceanography, are in the latter, smaller group. They agreed that proof would lie in performing the most accurate measurement of gravity possi-

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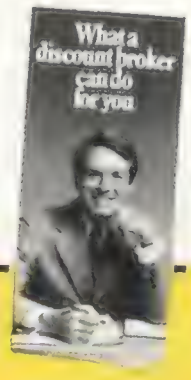

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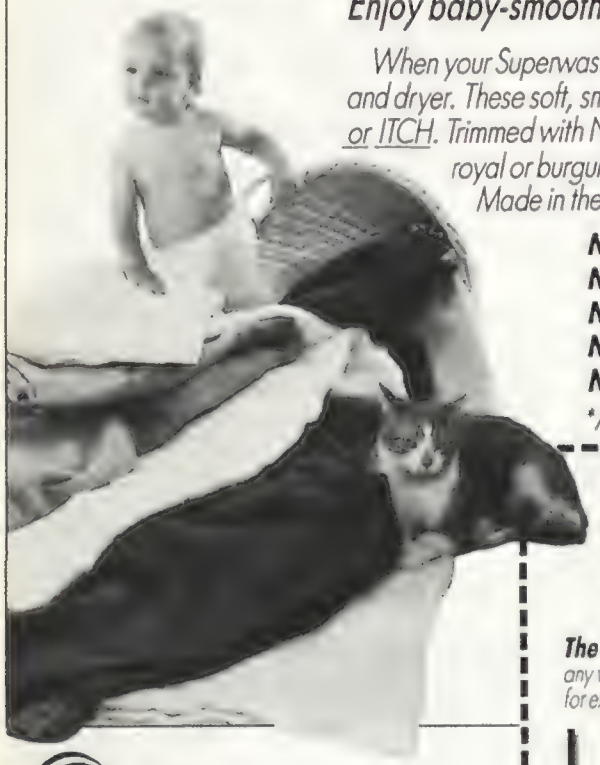

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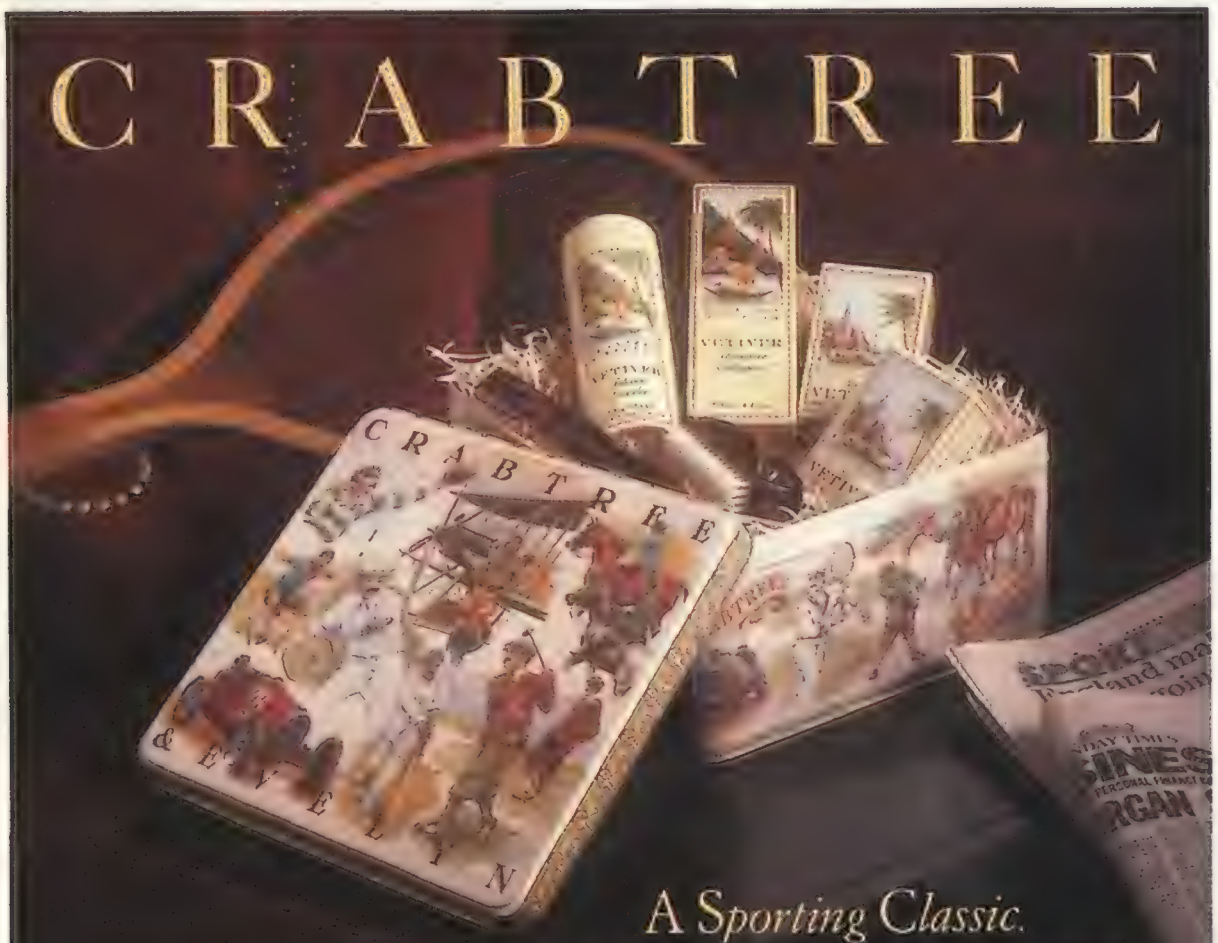

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ble, using the most complete controls available, in what may be the biggest laboratory in the world. With measurement points carefully preplanned to fit into a complex mathematical model, an experiment was laid out to measure gravity across and through one of the Earth's ice caps. A deep borehole through the ice would help. There is one in Vostok in Antarctica, but it belongs to the Soviets. Another was closer; the Polar Ice Coring Office (PICO) of the University of Nebraska put one in Greenland a few years ago, near a DEW line base.

Accuracy and size would be the experimental keys, not the elegant, but in this case unnecessary, precision of the laboratory. I wasn't sure I understood the distinction. Ander pointed to a cheap digital watch I was wearing, one of those that does 15 useless things at the push and repush of two or three buttons. Mine read temperature in both Fahrenheit and Celsius to one decimal place.

"What temperature is it?" he asked.

"I'm not sure," I said. "This thing's always 10 or 15 degrees off."

"So, it gives you the wrong temperature with a precision of a tenth of a degree. Right?"

I got the point. "So you're going to measure gravity with some precision but lots of accuracy."

"Right!"

"How?"

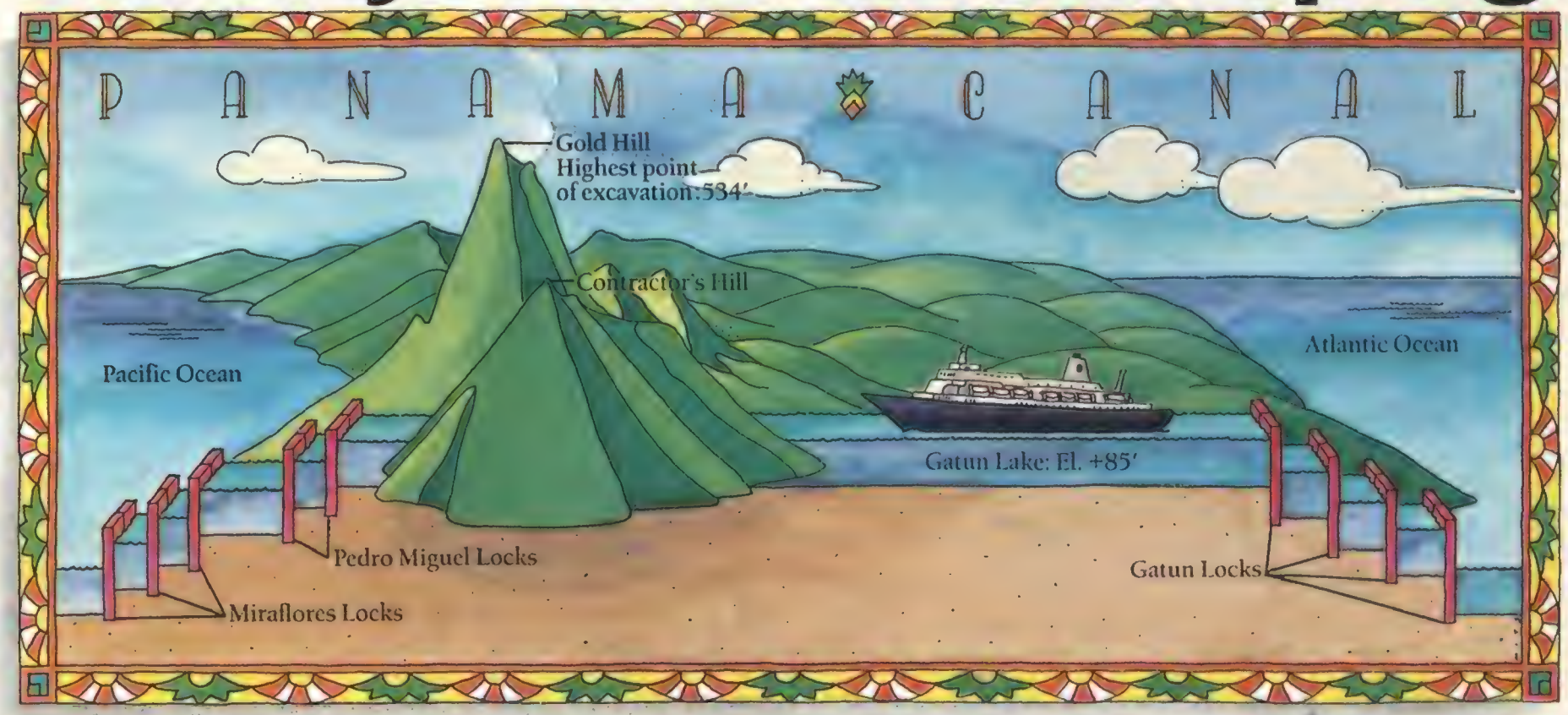
"By going to the Greenland ice cap."

I didn't know exactly what that meant, but as a documentary filmmaker, I knew the next question. "Can I come, too?"

The landing on skis had been strangely smooth and noiseless, no familiar touchdown chirp of rubber grabbing concrete. A couple of yellow snowcats scurried out to meet us, blowing diesel exhaust sideways into the wind. We were whisked away to the foot of DYE 3, the huge radar station. Besides Mark Ander and Mark Zumberge, there was Mark Stevenson, also from Scripps (the three came to be known as the Marx Brothers). Carlos Aiken and Elizabeth Fisher had come from the Center for Lithospheric Studies at the University of Texas at Dallas, and Ted Lautzenhiser and Jim Wirtz from Amoco in Oklahoma. Lyle Hansen and Casey Rohn represented the Polar Ice Coring Office. Others were to follow soon.

The 60-foot climb up the metal staircase had us all puffing. DYE 3 is 8,300 feet above sea level. The air is not only cold but thin. Once inside the station,

Cutaway To The Canal This Spring.



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we felt as though we were aboard a ship. Everything was metal, painted and repainted many times. I could feel the throb of engines through my boots, and the smell of diesel was everywhere.

During the days I spent at DYE 3, I found only four windows. The station's designers, I guess, had reasoned that there was virtually nothing to see: six months of ice in summer and six months of nothing at all in winter. Better to focus inward on the reassurance of life and warmth within. Of the four windows, three were tiny and all in the dining room. Inge, the Danish cook and only female permanently aboard, had planted window boxes beneath each. A few pale plants struggled for life. Inge told me that on her one vacation off the ice cap in 18 months she had gone home to Jutland and been snowed in. The rest of the staff, about 14 in all, worked in three shifts around the clock. Some were Danish, some American. Rarely did more than five or six souls gather together at any one time. Calendars marked off days, and pictures of beaches, boats and bikini-clad women were posted everywhere.

Our job was down on the ice. Scientists and engineers scurried in all directions, some on foot, looking huge in parkas, hoods and coveralls. Others would flash by on skimobiles, headed off toward the horizon towing sleds full of equipment. Nobody had eyes. Each face was a suntanned mask inlaid with shiny mirrors to guard against the blinding light. Noses and lips were gaudily painted to block the dreaded sun. Reflection off the ice had reportedly sunburned even the insides of one man's nostrils.

Zumberge and Stevenson made gravity measurements, 12 and 14 hours a day, at sites across the wasteland plotted by Robert Parker back at Scripps. Zumberge's fingers were deeply split and painful from making delicate adjustments without gloves in the dry cold. Carlos Aiken and Elizabeth Fisher ran survey levels across the ice, warming inside their parkas a portable computer when it grew too cold to function. Ted Lautzenhiser and Jim Wirtz, along with Lyle Hansen and Casey Rohn, worked the wellhead. Five years earlier, PICO, along with Danish and Swiss groups, had drilled this well to a depth of more than a mile. Movement in the ice was bending it and moving it sideways but it had been filled with a diesel fuel-based mixture and kept open. This was the focus of the search for the fifth force. Mark Ander stayed here, but tore across the ice in a skimobile whenever a team fell shorthanded.

Near the wellhead was the Igloo, a geodesic dome built by PICO. After five seasons it was almost completely buried beneath the ice. The entrance was a long wooden tunnel from the surface. Everything disappears on the ice cap. It's just a matter of time. If something is warmed by the sun it begins to sink. I saw pipes and tools and even scraps of paper, dropped the day before, begin to disappear. Even without the sun, the annual snowfall does the job, covering anything and everything sooner or later. The area around the Igloo was marked with a variety of colored flags. You flag a submersed structure if it is still close enough to the surface to be useful. After a while you simply let it go. Even DYE 3 must be jacked up on its eight legs periodically. When it runs out of legs, they cut them off and let them go under, and move the huge station to another spot and a new set of legs.

One day, with a gloomy expression on his face, Jim

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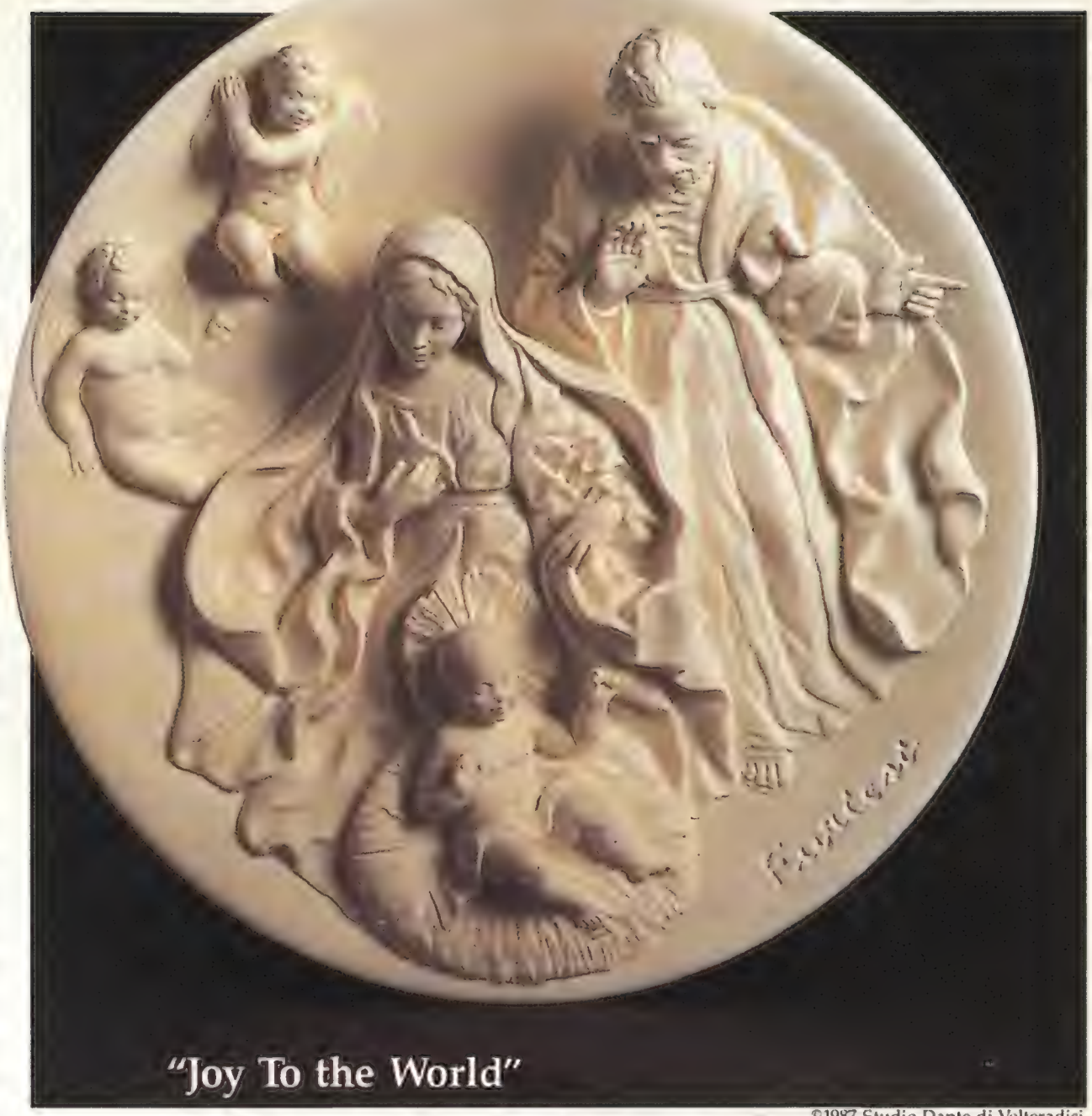

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Wirtz looked out across the bleak, dimensionless expanse and said, "They promised me there would be a beautiful woman behind every tree." Oscar Maple, the station manager, told us about wildlife at DYE 3. "Sometimes a storm blows a few birds out onto the middle of the ice cap," he said. "It's always a death sentence." And then he talked about polar bears.

"It's really rare that we see a polar bear out here," he said. "They aren't even on the coast anymore. Most of them have been hunted out of existence. But there still are a few, and once in a rare while one gets lost or crazy or something and gets out this far. We saw one come by a couple of years ago. Any polar bear out this far is hungry—very hungry. And they can run faster than a skimobile," he added.

Carlos Aiken got a little pale and said, "Great. That's just great." He was due out on the ice with Elizabeth Fisher after supper. They would be running the outside survey lines about five miles from the station on a skimobile.

Days came and went according to the clock. The sun never really went down. All the gravity stations on the ice were "fixed" by global positioning satellite to within centimeters. And they were fixed again, using traditional survey methods. Finally, the radar team, hauling their heavy equipment across the ice, made a map of the rock surface a mile and a half below. Every possible influence on the accuracy of the gravity measurements would be known in detail.

I left everybody still scurrying about on the ice when I had the material I needed to document the expedition. If they do find the fifth force, it will be back home in the Los Alamos supercomputer when the number crunching is done. And then, there's talk of working with the Russians this winter in Vostok to check everything out again. My friends at DYE 3 did make me feel like a deserter, though, as I plodded toward the plane, head down to keep from looking into the prop wash. One Greenland horror story tells of a man who looked up. The fluid in his eyes was flash-frozen. I made a mental note to send some New Mexico cacti to Inge for the dining room.

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Poling into swampy Sundarbans delta, where tigers are unusually aggressive, village fishermen wear clay masks on the backs of their heads to baffle the enemy (tigers usually leap from behind to attack prey).

By Geoffrey C. Ward

India's intensifying dilemma: Can tigers and people coexist?

Efforts begun in 1973 to save the animal and its habitat are working, but it is the local villagers who are paying the price

Secure in preserve, tiger takes a plunge; powerful swimmers, they're among the few water-loving big cats.

To the first-time visitor, Kheri District in the north Indian state of Uttar Pradesh seems a lovely, prosperous place. Tall green stands of sugarcane alternate with still-greener fields of wheat and brilliant yellow blankets of mustard. Brightly painted tractors rattle past with well-dressed Sikhs at the wheel. At harvest, the sweet smell of the sugar factories is overpowering and the lines of bullock carts filled with cane waiting to be sold stretch along the roads for miles. The hazy

blue line of the Himalaya hangs above the horizon; the mountain kingdom of Nepal lies only a few miles to the north.

But the apparent tranquility is misleading: some 20 people are killed each year in encounters with the tigers whose home this region has always been. The Indian tiger has been brought back from the brink of extinction—official figures indicate that its numbers have more than doubled since the Indian government, in cooperation with the World Wildlife Fund and other international conservation organizations, set out to save it just 14 years ago—yet the future of these magnificent animals and of the forests over which they reign remains very much in doubt.

Conservationist Arjan (Billy) Singh has spent his life crusading for survival of the tiger and its habitat.

The conflict between men and animals in Kheri is more clear-cut and dramatic than that found almost anywhere else on the Indian subcontinent, but during the three months I spent traveling through some of India's and Nepal's remaining forests last winter, the problems this region faces seemed symptomatic of what is likely to occur wherever conservationists succeed in rescuing the tiger and even a small sampling of its world.

Until 1947, most of Kheri was considered unfit for human habitation. It is part of the Himalayan terai, a thick belt of deep forest and soggy grassland ideal for tigers and their prey, but hostile to settlement because of its inaccessibility and the malarial mosquitoes that swarmed out of its swamps. Independence changed everything. Eager for additional land on which to grow more food and relocate thousands of refugees fleeing the partition of the Punjab, the new Indian government drained the swamps. The great forests were felled for new farms and commercial profit. Hundreds of thousands of landless people followed in the wake of the first settlers.

Forced into a few pockets of jungle

The surviving tigers withdrew to a few small pockets of surviving jungle. Dudhwa National Park is one of these, a 200-square-mile tract of grassy meadows and groves of lofty *sal* trees that would also have been destroyed had it not been for one of India's best-known and most-controversial conservationists, Arjan Singh. Still vigorous at 70, and known to friends and adversaries alike as Billy because of a boyhood fondness for the adventures of Buffalo Bill, he has farmed in Kheri since 1946 and now lives at the southern fringe of the park on a farm called Tiger Haven.

He is a thorny, blunt man ("Billy talks," says a longtime friend, "the way a tiger would if it could talk"), and to him the great predator's survival is everything. His stubborn efforts to reintroduce three hand-raised leopards and a tigress to the forest have sparked controversy, and there are few conservationists with whom he has not quarreled at one time or another during the past 40 years. But no one faults either his courage or his dedication. He has written four books; has won the *Padma Shri,* one of India's highest civilian awards; and is the sole Asian to receive the World Wildlife Fund's Gold Medal.

Dudhwa is his monument; having persuaded the government to declare it a sanctuary in 1968 in order to save one of India's last remaining herds of swamp deer, he remains its tireless guardian, squinting shirtless in the sun while thumping out angry letters to the newspapers on an ancient typewriter, or speeding through the forest in his open jeep to check out

Pair of tigers are among motifs painted on the walls of village houses on periphery of Ranthambhore Park.

Pugmarks, here unnervingly juxtaposed with human prints, are key tool in estimating tiger populations.

rumors of illicit fishing or look for a lame tiger seen limping along the road.

Billy now fears all his efforts may have been in vain, that the extraordinary animals to which he has devoted most of his life may ultimately be doomed because government has proved unable to keep Man and tiger apart.

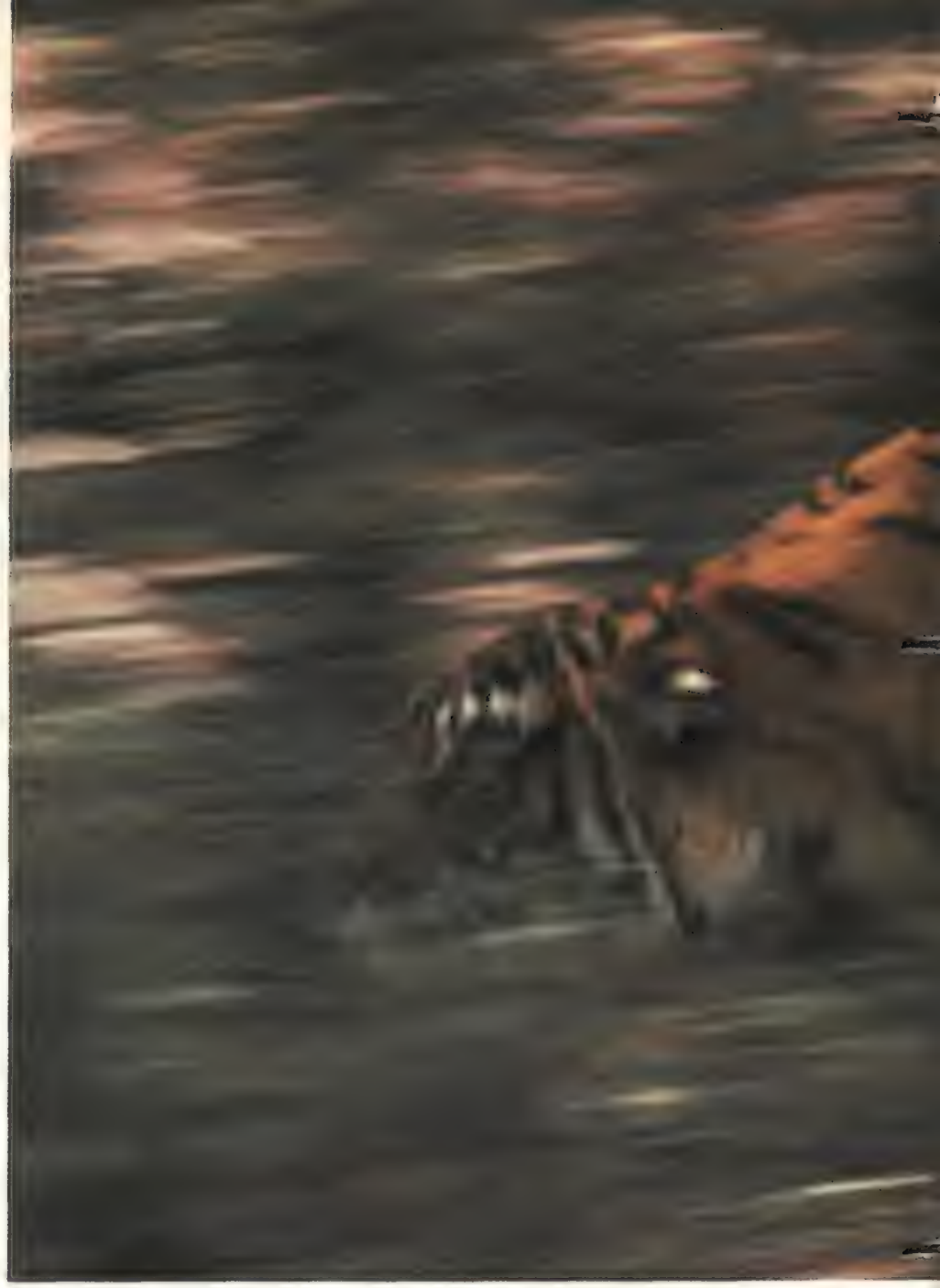
The 1973 international effort to save the tiger was begun none too soon. Three of the eight subspecies that once hunted from Iran to Siberia had already vanished; two more seemed about to share their fate. And even in India, where there are said to have been 40,000 tigers at the century's turn, fewer than 2,000 were believed to survive in the wild, many of them in scattered groups too small to maintain their numbers, let alone multiply.

In setting out to save the magnificent predator that has become its national animal, India had twin objectives: "to ensure the maintenance of a viable population of tigers" and "to preserve for all time, areas of biological importance as a national heritage for the benefit, education and enjoyment of the people." The core areas of the tiger reserves, off limits to humans, were meant to be "breeding nuclei, from which surplus animals would emigrate to adjacent forests." Broad buffer zones, where human incursions were to be restricted, would shield the breeding grounds from disturbance.

A visitor can only marvel at the seriousness with which India, faced with so many challenges, has worked at wildlife preservation in recent years: in 1975 there were just 5 national parks and 126 sanctuaries in the whole country; those numbers have grown steadily since, and now encompass 54 national parks and

Survivor of two attacks by the same tiger, old farmer who lives near Dudhwa Park displays frightening scar.

In Sundarbans, clay dummies are electrically wired to shock attacking tigers; dummy at right was mauled.



Running at full tilt, a male tiger closes in on his prey, a fleeing sambar, in Ranthambhore Park.

248 sanctuaries. Fully 12 percent of India's national forests are set aside for wildlife, more than 38,610 square miles. To create these havens the local populace has often been called upon to make great sacrifices. Villagers had to be moved from their forest homes, and the grazing of livestock and gathering of wood, grass and wild honey that had gone on for centuries was abruptly ended.

"It is an enormous investment for a poor country to have made," says R. L. Singh, the director of Project Tiger, a patchwork of 15 prime tiger reserves. "Our task now is to manage it wisely."

That investment has already paid off, at least in the short term. Even Billy concedes that there are many more tigers now than there were 14 years ago.

Just how many more, however, is a matter of controversy. Tigers are secretive, mostly solitary creatures and precise facts about them are hard to get. The most recent official figure is 4,005 animals, the grand total of the national tiger census in 1984, which includes all national parks and state sanctuaries, plus an estimate of all the animals said to live in the forests outside their precincts.

This census is a considerable undertaking: hundreds of thousands of square miles of forest are divided into individual blocks; then, in a given week, each square is systematically crisscrossed by forest department employees who search for tiger pugmarks while noting all the wildlife they see along the way. Some 10,000 men take part, equipped with glass plates on which they trace any prints found and record their location. Forest officers then compile the results and are supposed to be able to identify the size and distinguishing features of each individual animal.

The bureaucratic completeness of these tallies is sometimes breathtaking. One park director told me last winter that he not only knew exactly how many tigers prowled his forest but the precise number of male and female mongooses and pythons living there, too. The census has recently come under a good deal of critical fire. R. L. Singh admits that roughly half the men taking part have had little or no training and, although one former field director went so far as to claim that each tiger's footprints are as unique as are human fingerprints, many researchers question the whole notion of identification by pugmarks. "It's all nonsense," Billy says. "I've been tracking tigers almost every day now for 40 years and even I am unable to differentiate from pugmarks alone between tigers of the same size

The author, a biographer and historian, writes often about India and its wildlife; his article on Benares appeared in SMITHSONIAN, *September 1985.*

One out of every five chases, which last for about two minutes, will result in a successful kill. No man eating has taken place here; the open terrain minimizes incidents of surprise or mistaken identity.

and sex, unless there's some abnormality—and even that doesn't always show up." During one count at Dudhwa, he told me, some field-workers solemnly turned in pugmark tracings that had five toes—one more than tigers actually possess. And an Indian researcher named Ullas Karanth has shown that there are simply not enough prey species in the parks he studied to support anything like the numbers of tigers some of their directors claim.

Seeing a tiger has become something of a national craze among middle-class Indians, and tourists are permitted inside the parks provided they do not go on foot. For some reason, tigers don't seem threatened by people mounted on elephants or riding in vehicles.

The real problem is not with casual visitors. It is the village poor living around the parks who run the real risks from tigers. According to R. L. Singh, about 600 people have been killed in the past dozen years. Between 50 and 60 people annually die from tiger attacks: 15 to 25 of them are killed in the Sundarbans, a vast, thick mangrove forest on the border between India and Bangladesh; the same number die in Kheri; and the rest are scattered across the subcontinent.

Most killings are still simply cases of mistaken identity—accidents. Since long before the advent of firearms, tigers seem to have been innately wary of humans on foot. And even when a tiger is surprised on a kill, it follows a fairly standardized routine to scare off anyone who ventures too close. First it gives a warning roar (I have heard this sound twice, and found it awesomely persuasive both times). Then it roars even louder. Then, if the intruder somehow *still* fails to back off, it may make a mock charge. Finally, as like as not, it will turn and run rather than launch an all-out attack.

Human beings walking upright and sticking to forest roads are relatively safe, then; it is when they wander off into the undergrowth and lean over, cutting grass or collecting firewood, so that they lose their distinctively human look, that the likelihood of tragic error seems to intensify.

One afternoon Billy invited me along on his daily

walk through the dense forest behind his house. I struggled to keep up with him as he paced ahead on his thick legs, a short, carved "tiger stick"—the only weapon he carries—cradled in his arm. We ducked beneath branches, picked our way through mud, stepped over fallen logs and twisted roots.

"There you are," he said, stopping suddenly and pointing straight ahead. Only a few yards away, I could just make out the bent backs of three men cutting grass. Even to me, their silhouettes looked like those of browsing deer. "That's just one reason why mixed use won't work," Billy said. "Tigers and Man cannot share space. It really is as simple as that."

Surviving two attacks by the same tiger

Encounters between people and tigers are usually but not always fatal. I met two survivors: a young Nepalese woman, mauled last winter while cutting grass in Royal Chitawan Reserve, who was still ambulatory despite the two neat round holes left behind her ears when her attacker's canines pierced first her skull and then her brain; and Shiv Shankar, a grizzled, 63-year-old farmer who lives near Dudhwa. He managed to survive two attacks by the same tiger, thereby surely qualifying for the *Guinness Book of World Records.* Flames from an overturned kerosene lamp scared off his attacker the first time; several days later, the shouts of his horrified companions drove the animal away again. I asked him to what he attributed his extraordinary good luck. He thought for a long moment. "I have always drunk a great deal of milk," he said.

The tiger's champions like to point out that one hundred times more people die in India annually of snakebites than die from tiger attacks; that the risk of a mauling is seven times less to a villager living on the edge of a national park than is, say, a traffic accident to an American commuter.

But to the family and friends of a tiger victim, statistics don't mean much and, increasingly, grief is being transformed into anger. This past March, a tiger killed a teenage girl just inside the boundary of Corbett Park, northwest of Dudhwa; and when her friends and relatives banded together to recover her body, the tiger charged into the angry crowd and killed one of her protectors. The grief-stricken villagers eventually recovered both corpses and bore them to the home of the park director, breaking his windows, smashing up forest department vehicles and demanding action.

"Why is man eating such a problem at Dudhwa?" I asked Billy, hoping to slow his headlong pace through the jungle.

"This was the most ecologically vulnerable area," he answered, continuing to push through the undergrowth. Dudhwa has a special problem, he explained:

At Ranthambhore Park, a tiger plunges into lake in pursuit of sambar after watching them wade in from

there is no adequate buffer zone. Cultivators have been allowed to plant sugar right up to the forest edge, and sugarcane, so tall and so thickly grown that two men cutting it ten feet apart cannot see each other, strikes tigresses as ideal cover in which to bear and hide their cubs. The cane field becomes their home, and when, at harvest time, the cutters move into it, the tigresses defend it fiercely.

"The sugarcane problem is unique to Dudhwa," Billy says, "but the clash will come everywhere. When this place became a park ten years ago, there were 21 villages and small settlements on the outskirts; now there are 80. Population is out of control everywhere in India, and the problem will spread as more and more tigers grow familiar with humans and come to see them as prey. Familiarity breeds contempt."

Anything that moves is a target of opportunity for a tiger, Billy explained as we headed back to his house. Their primary prey is deer, but when hungry enough they have been known to feed eagerly on anything from baby elephants to frogs and locusts—and instinct teaches them to sample whatever they kill. A herds-

a hidden spot on shore. The large, heavy deer, which often feed in water, are the tiger's main prey here.

man killed trying to stop an attack on his buffalo at the park's edge may become a substitute for that buffalo. The next time, another herdsman may become the primary target.

Man eating is not new and it was once a good deal worse. Tigers accounted for the deaths of about 500 human beings and 20,000 cattle in a single district of the Bombay Presidency in 1822. Between 1902 and 1910, an average of 851 people were killed and eaten every year in India. The notorious Champawat tigress alone killed 436 people before Col. Jim Corbett, the most intrepid dispatcher of Indian man-eaters, managed to hunt her down.

A man-eating tiger, Corbett wrote after a lifetime of hunting them, "is a tiger that has been compelled through stress of circumstances beyond its control to adopt a diet alien to it. . . . The stress is, in nine cases out of ten, wounds, and in the tenth case, old age." Another circumstance helping to produce that fatal stress has traditionally been the degradation of the tiger's habitat and the disappearance of prey species on which it normally depends. In order to survive in a steadily shrinking forest, old or ailing tigers turned first to livestock and then to humans.

Now a third, still more troubling variety of man-eater seems to be emerging, and the irony is that the brand-new "stress of circumstance" that seems to produce it is the success of the parks themselves as breeding grounds. Tigers are territorial. Although they often cover 15 miles in a night in search of food, the jungles through which they move so quietly are divided by them into distinct territories connected by a complex network of trails, their limits marked in a variety of ways—warning roars, scratch marks on the trees, the meticulous spraying of trees and other natural boundary markers.

The barriers between animals are not impenetrable: a tigress will sometimes share her territory with her grown daughters, and a resident male allows several breeding females to occupy segments of his range. But he rarely shows similar generosity toward other males, including his own sons, and so, as tigers continue to breed within the undisturbed core areas of the parks, young animals—or weakened old ones— are driven out toward the periphery. The forest corridors between parks that the planners of Project Tiger had hoped to maintain for just such immigrants have largely failed to materialize under the competing pressures of population and agriculture, and these hungry displaced animals are forced to cling to the forest edge. Increased confrontations seem inevitable.

They have already begun at Chitawan where, until 1980, there had been no documented cases of man eating at all. Since then, Charles McDougal, the American tiger expert who has been conducting research there for many years, told me 13 people have been killed and eaten around that park, most of them by battered animals that had lost out in the struggle for territory.

Openness of terrain minimizes danger

It is not the growing numbers of tigers alone, but the ever-increasing isolation of the forests in which they are forced to fight to survive that is making things worse. This seems to be demonstrated in reverse at Ranthambhore, in the desert state of Rajasthan. It is one of the most populous tiger reserves (I saw seven tigers there in just two days last year), yet Ranthambhore has never experienced man eating. Unauthorized intrusions have until recently been kept to a minimum by the dedicated project director, Fateh Singh Rathore, and his foresters, and the unusual openness of the Ranthambhore jungle minimizes the danger of accidents. A stalking tiger can recognize his potential prey over much longer distances here than he can almost anywhere else in India. But most important, its

director believes, is that his young tigers, unlike those elsewhere, still have an escape route to follow when they reach maturity, a sizable patch of tattered forest just a few miles away across the fields; he has recently found pugmarks and other signs of tigers there, and has lobbied hard to have that area declared inviolate too.

There is one region where generalizations about Indian man-eaters have never applied—the Sundarbans. There seems to be no shortage of natural prey in this huge, forested delta, and the swampy terrain precludes permanent human habitation. Yet, since at least the 17th century, tigers have systematically preyed upon the villagers who slip up its canals and inlets in small boats to fish, cut wood and collect honey. In 1666, Francois Bernier, a French visitor, wrote, "Among these islands, it is in many places dangerous to land, and great care must be had that the boat, which during the night is fastened to a tree, be kept at some distance from the shore, for it constantly happens that some person or another falls prey to tigers. These ferocious animals are very apt . . . to enter into the boat itself, while the people are asleep, and to carry away some victim."

There are now officially said to be some 260 tigers in the Indian Sundarbans alone, the largest concentration on Earth, and they continue to be mysteriously aggressive. In fact, one out of every three is thought to be an "opportunistic" man-eater, one that will kill and eat any vulnerable human it happens to encounter. No one is certain why. Some believe the daily tides that wash away the tigers' scent markings force the animals to be unusually combative in order to hold on to their territories. Another possible explanation is that too much salt water might affect their livers, rendering them especially irritable; freshwater ponds have been dug here and there in hopes of restoring their equanimity. Authorities have also urged villagers to wear clay masks on the backs of their heads to confuse tigers on shore (tigers are reluctant to attack their prey from the front) and they have erected clay mannequins throughout the forest's buffer zone, each dressed in unwashed, villagers' clothing and wired to a souped-up car battery. The hope is that any tiger that attacks one of them and receives a 230-volt shock will learn a valuable lesson and may pass that lesson along to its offspring. Eleven dummies had been mauled by last March and the annual number of Sundarbans killings (which used to run between 55 and 60) has been roughly halved. It is too early to tell whether one or more of these programs or other, un-

Tourists are permitted inside the tiger reserves but they may not go on foot; instead, they are brought in by elephant or by wheeled vehicle. Seeking big tips, guides sometimes try to get a rise out of tigers.

Sunrise over Corbett National Park, first to be established (in 1936); its 201 square miles support perhaps 100 tigers.

Surprised tiger growls at an intruder; usually, it will threaten rather than attack.

known factors have been responsible for the change.

Despite the continuing difficulties around the periphery of the Sundarbans, however, the great forest's inhospitableness to Man and the large number of tigers that live undisturbed within it make it one of the most likely places for a permanent tiger population to persist.

"The tiger will survive in India," R. L. Singh says, "only so long as it behaves. The moment we try to be sentimental about any aberrant, defaulting tiger, the tiger will be doomed. Such tigers must be eliminated immediately. We are serving people first." He claims personally to have shot three man-eaters during his six years as field director at Dudhwa, and a total of ten animals was officially done away with. "The fault is Man's, of course," Billy says, "but the tigers are always made to pay."

Old-time professional hunters, forced to find other work since tiger shooting was banned in 1970, have eagerly volunteered to oversee the culling of undesirable animals. "Despicable," Billy adds. "They used to get $10,000 a tiger from their clients before hunting was stopped. They just want to get back into the act." Their unselfishness does seem suspect since they also want the right to contract rich overseas hunters and fly them in to do the shooting, a process that could take weeks while more innocent villagers die.

Some have suggested that "troublesome" tigers be transported to a forest where they are less likely to encounter humans. But other tigers often already occupy such places. Some years ago, a young Sundarbans tiger that had wandered out of the core area and killed first livestock and then a herdswoman, was tranquilized, taken to a spot deep in the jungle and released. The resident male killed it before the week was out.

Compensation for livestock killed by a tiger ranges up to 2,000 rupees (about $154) for a prime animal, provided the killing took place outside a park. (If a cow or buffalo strays inside the forest and is killed, its owner gets nothing.) The family of a human victim receives 5,000 rupees (roughly $384). Bureaucratic confusion often delays payment and sometimes causes it to be overlooked entirely. A man convicted of killing a tiger, on the other hand, must pay a fine of 5,000 rupees *and* serve six months in jail.

Despite the risk, villagers often take matters into their own hands. Last year, in and around Dudhwa, at least 13 tigers died in mysterious circumstances. One had its head blown off by a bomb planted in its kill; a forest guard was found burning the corpse of another tiger rather than have his superiors find out that one of his charges had been slaughtered. And Billy himself came upon the skeleton of a third surrounded by the reeking corpses of close to 150 vultures; someone had poisoned the tiger's kill, the tiger had eaten from it and died, and the poison remaining in its body, in turn, had done in the overeager scavengers that had fallen upon it.

Billy has not mellowed, but he has matured. In the old days, battling single-handed to defend his park's

borders, he pummeled with his big fists the woodcutters and graziers and poachers he captured, sometimes even hauling them behind his tractor to park headquarters. He is as vigilant as ever but now sees that the poor are not the real enemy.

"How can you blame the cultivator?" he asks. "He has one acre of land and one bullock to plow it. If a tiger takes that bullock, what is he to do? No wonder he wants tigers done away with. It is government's fault. They have set up these parks and now they walk away from the problem."

"The local people hate the park," Billy told me as I drove off to talk to villagers in the surrounding countryside. "And they hate me. You'll see."

I left Tiger Haven along a twisting forest track, pulled onto the tarmac road and almost immediately passed a wealthy landowner's concrete house surrounded by the thatched huts of his tenants. A gaudy tent was set up in the landlord's garden with loudspeakers lashed to poles, so that his daughter's wedding ceremony that evening could be shared with his neighbors. A little farther along, I pulled over to let the groom's party pass, perhaps 75 laughing men in beards and turbans, dancing to the crash and blare of a brass band on their way to the home of the bride.

I stopped beside a field, where an old man was plowing behind a haggard bullock. His name was Kanthulal and he had lived there all his life. Things had been much better before the park was established, he said; he had been able to collect his firewood without fear of arrest, could buy timber and thatch to shore up his house after the monsoon. Hunters had kept the tigers down. Now he lived in fear. The wife of a boyhood friend had been killed cutting cane; he had himself twice seen tigers padding along the road and often saw their fresh pugmarks on his way to the fields in the early morning.

Two young cyclists stopped and walked their bicycles across the ruts to join us. They agreed. "Government cares *only* about tigers," one said. "They do not care about us."

"We might as well be dogs," the third man added. "In my village no one stirs from his hut once the sun has gone down."

I thanked them and continued on, past teams of cutters half-hidden in the cane, and stopped beside the prosperous-looking young Sikh who was supervising their work. A tiger had recently slipped into his compound at night and taken a fine buffalo. He had been helpless because he was not permitted a rifle. Forest officers had visited him but had done nothing.

Billy was right: no one who lived around the park seemed to have a good word to say about it. Nor did most of the villagers who clustered in and around the other reserves I visited seem anything but resentful of the parks' existence, and their smoldering hostility sometimes flares into open warfare. At the Keoladeo Ghana bird sanctuary in the desert state of Rajasthan a few years ago, for example, eight men were shot dead by police when they refused to pull their animals out of the park in which their fathers had grazed them for a century. Shortly before that, herdsmen at nearby Ranthambhore beat Fateh Singh Rathore, the field director, almost to death for trying to bar their herds from his forest.

Hard times make things still worse. The Ranthambhore region has been hit by drought three years in a row now, withering what little fodder the seared, chewed-over landscape outside the park normally provides. This past summer, thousands of cattle swarmed through Ranthambhore's ravines, and political pressure forced the field director from his post. Ranthambhore survives and so do its tigers—but the future remains uncertain.

Forest resources are rapidly vanishing

The villagers' view is ecologically shortsighted, of course. Most know only what their fathers knew—and the forest resources upon which their fathers relied have all but vanished. According to satellite data, every year India loses more than three million acres of forest, an area a little larger than Connecticut. There are more than 730 million people in India, and perhaps a billion head of domestic livestock, almost all of it undernourished and forced to forage to survive. "We face ecological disaster," Prime Minister Rajiv Gandhi has said of the disappearing vegetation, and with aid from abroad the central and state governments have undertaken massive reforestation projects. But trees continue to fall, precious grasslands are steadily devoured, whole hillsides tumble into riv-

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ers. You can see what is happening almost anywhere along the Indian roads. Brightly painted trucks overloaded with newly cut logs careen around the curves. In the purple evening light, bands of barefoot women hurry home with heaps of branches balanced on their heads. Long lines of lean buffalo, gaunt cattle, scrawny goats drift out of the forest, leaving more acres stripped, and plod toward villages already shrouded in blue woodsmoke. Increasingly, the parks are becoming green islands in a human sea.

Indian conservationists have always hoped that in ensuring survival for the tiger, human survival would be enhanced as well. "We are here to preserve the habitat, not the individual tiger," R. L. Singh says.

"But how can local villagers be expected to understand that?" Billy asks. "No provision is made for supplying them with alternative fuels, for teaching them other ways to build their houses or thatch their roofs or feed their animals. We must face the fact that the park does not benefit them. Why should they want to preserve it?"

Valmik Thapar, a shaggy young naturalist and filmmaker who has been studying and writing about Ranthambhore's tigers for a decade, agrees: "Villagers must be involved in these parks, must be made to feel a part of the necessary changes, not their helpless victims. The future of Indian wildlife ultimately rests with the villages that surround them." He and Fateh Singh Rathore have proposed that local banks provide villagers who pledge to stay out of the forest with low-interest loans for buying improved livestock, for example, and that those new animals be stall-fed on grass planted and maintained outside the reserve by the forest department itself. "The ideal," Thapar says, "is that the parks will eventually provide so many benefits to the villagers that they demand that more degraded forests be made into parks."

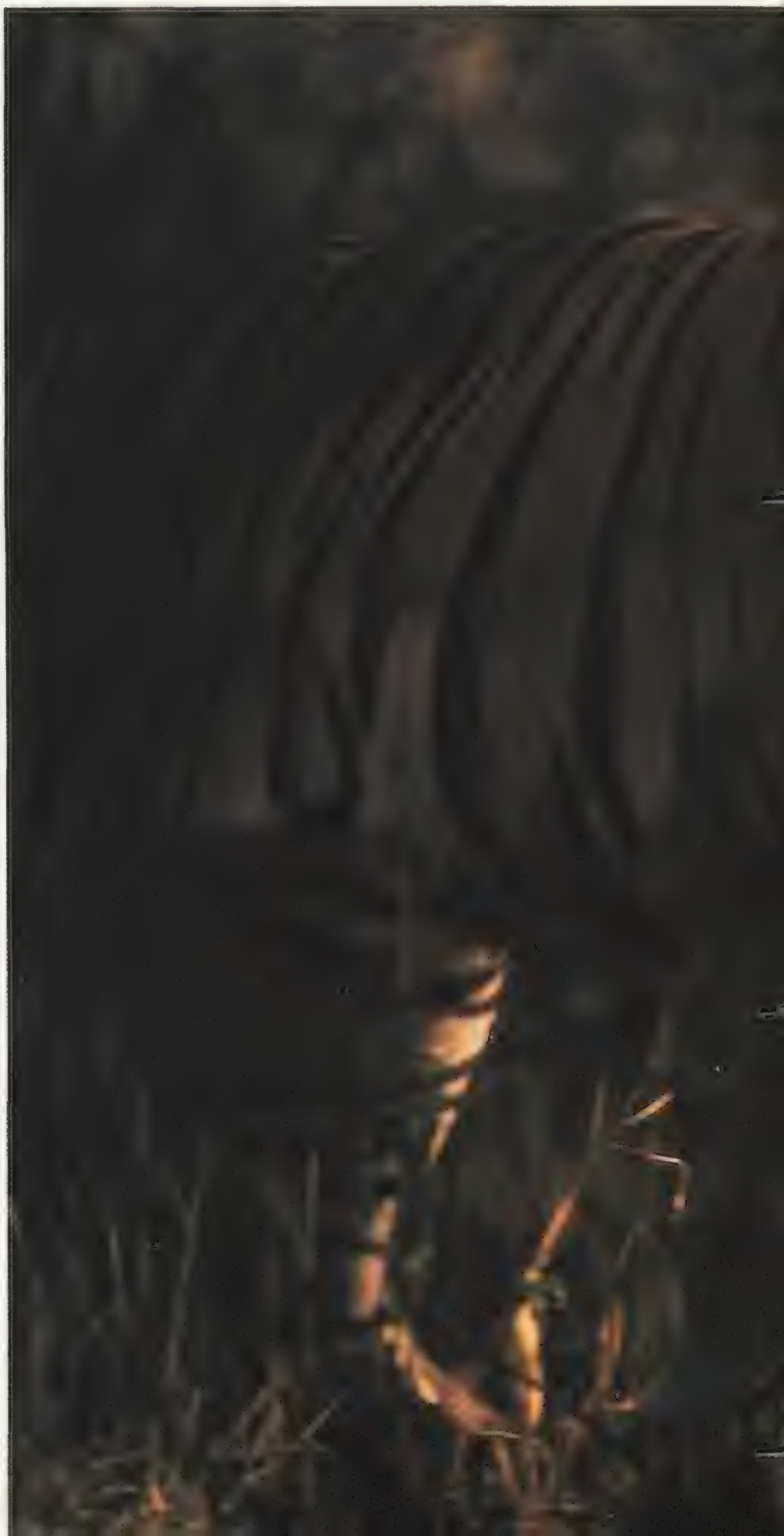
Billy concurs, but such programs take time to implement. "Meanwhile," Billy argues, "the only real answer that is fair to both sides is to keep people and tigers apart." He wants a high electrified fence put up around Dudhwa to keep tigers in and people out, and a permanent ban on the growing of sugarcane within five miles of it.

But thousands of people would be thrown off the land. Something else would have to be provided for them to do. Isn't this sort of undertaking too large to assume for a country with limited resources and so many pressing problems?

"Saving the tiger—and the forests it lives in—is itself a large undertaking," Billy answers. "If we are serious about it, we have no choice."

"Why do you go on?" I asked Billy. "The odds must sometimes seem hopeless." "A quirk of personality," he says, eyes flashing with their old fire. "I could not live with myself if I gave up."

Conservation is always a question of priorities and Billy's are clear: "Tigers need unmolested forest in which to multiply. People can breed anywhere." But government inevitably has a more crowded agenda.



His body a finely tuned hunting machine, a tiger moves stealthily through the grasses of Ranthambhore.

The question remains whether in a democracy like India—where, as Billy says, "Tigers don't vote; people do" and where many of those voters are understandably preoccupied with their own day-to-day survival—government can make ordinary citizens see in time that their own future well-being and that of the Indian forests and the superb animals that still rule some of them really are inextricably linked.

On my last evening at Dudhwa, I sat with Billy across a stream from a tiger's kill. The moon cast just enough light for us to make out the tiger's silhouette, but we could clearly hear him muttering as he tore at his kill, alarming but natural sounds that have been heard here since the beginning of time.

Then, a new and ultimately more ominous noise drifted toward us from across the cane fields at our back: the amplified drone of the wedding priest in the nearby village. A new family was beginning; still more people would soon edge toward the tiger's last retreat.

It was already hard to hear the cracking of the bones.

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Opposite: Contorted with age, huge bristlecone pine defies the wind atop a rocky ridge in the Great Basin National Park. Tree is area's most unusual species but mountains of Snake Range (above) host many others.

By Donald Dale Jackson

The Great Basin is a lonely place for a national park

Remote, rugged and risky, this daunting new preserve in Nevada is not everybody's cup of tea—which could be all to the good

"Better lock your jeep," Al Hendricks said. "This is a rough neighborhood." Hendricks, photographer Terry Moore and I had just driven up a tortuous switchback road best suited for tanks and mountain sheep, through sage-flecked rangeland, past abandoned mines and marble cliffs to a point near the crest of 11,658-foot-high Mount Washington in eastern Nevada. We were in the Great Basin National Park, which was dedicated last August as the 49th and newest of the National Park Service's "crown jewels." Hendricks, the superintendent, told us that a character-building hike down a steep talus slope and across a broken limestone ridge would lead us to one of the park's several stands of bristlecone pine trees.

A bright and articulate man full of ranger vim, Hendricks has a special affection for bristlecones. Burnished by wind, sand and ice, these natives of the basin are, at 4,000-plus years, the oldest-known living entities on the planet. Referred to formally as *Pinus longaeva* for their longevity, they survive centuries of winter storms and summer droughts with the help of their resinous, moisture-resistant wood and foxtail-

Photographs by Terrence Moore

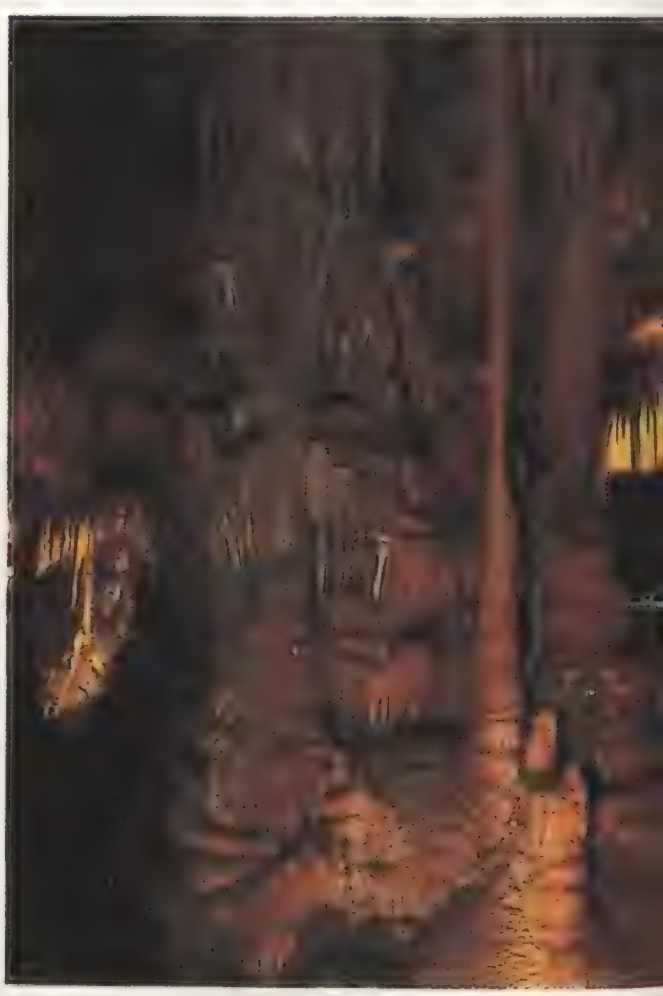
Superintendent Al Hendricks takes his ease in a stand of bristlecones he considers "finer than frog's hair."

shaped clusters of needles that live up to 30 years before yielding to a new generation.

A geologist by training, Hendricks was formerly in charge of Lehman Caves National Monument, a mile-square province of spectacular limestone formations that became a central feature of the new park. He was named superintendent soon after President Reagan signed the bill last year that made Great Basin the first tract of land outside of Alaska to be added to the national park system in 15 years. Now, gazing out at the ramparts of dark serrated peaks that marched toward the horizon, he pointed out that most Nevada mountains were formed from sedimentary rock, once the bed of an ancient sea, that had been stretched and tilted and hurled upward.

We skirted a cliff and worked our way cautiously down the gravel slope beneath a sky patched with darkening clouds. Columbines protruded defiantly

State highway heads toward foothills in the park after passing through the "downtown" section of Baker.



In Lehman Caves, the columns extend between floor and ceiling.

through flaky rocks. "I found a bighorn sheep carcass up here recently," Hendricks said. "Looked like it fell off the edge." I stifled an impulse to ask what we were doing there if a surefooted bighorn couldn't handle the grade. Hendricks plunged on across the limestone ridge to the bristlecone grove.

The old trees stood on an exposed ridge, separated from one another by a discreet distance that seemed to preserve their natural dignity. A few grotesquely contorted, marble-sided trees clung tenuously to life through strips of bark only an inch or two wide—narrow blood vessels, in effect, that kept the arboreal heart beating. "This is one of my favorite places in the park," Hendricks declared. "Look at this tree, it's built a wall of protection against the weather with its own trunk. Think of the tenacity. Sometimes when a bristlecone finally tips over and dies it provides shelter for another one. Scientists can read the climate back more than 9,000 years from some bristlecone rings" (SMITHSONIAN, July 1985). He looked around contentedly. "This is one of the most classic places you'll ever see," he said. "I think it's just finer than frog's hair."

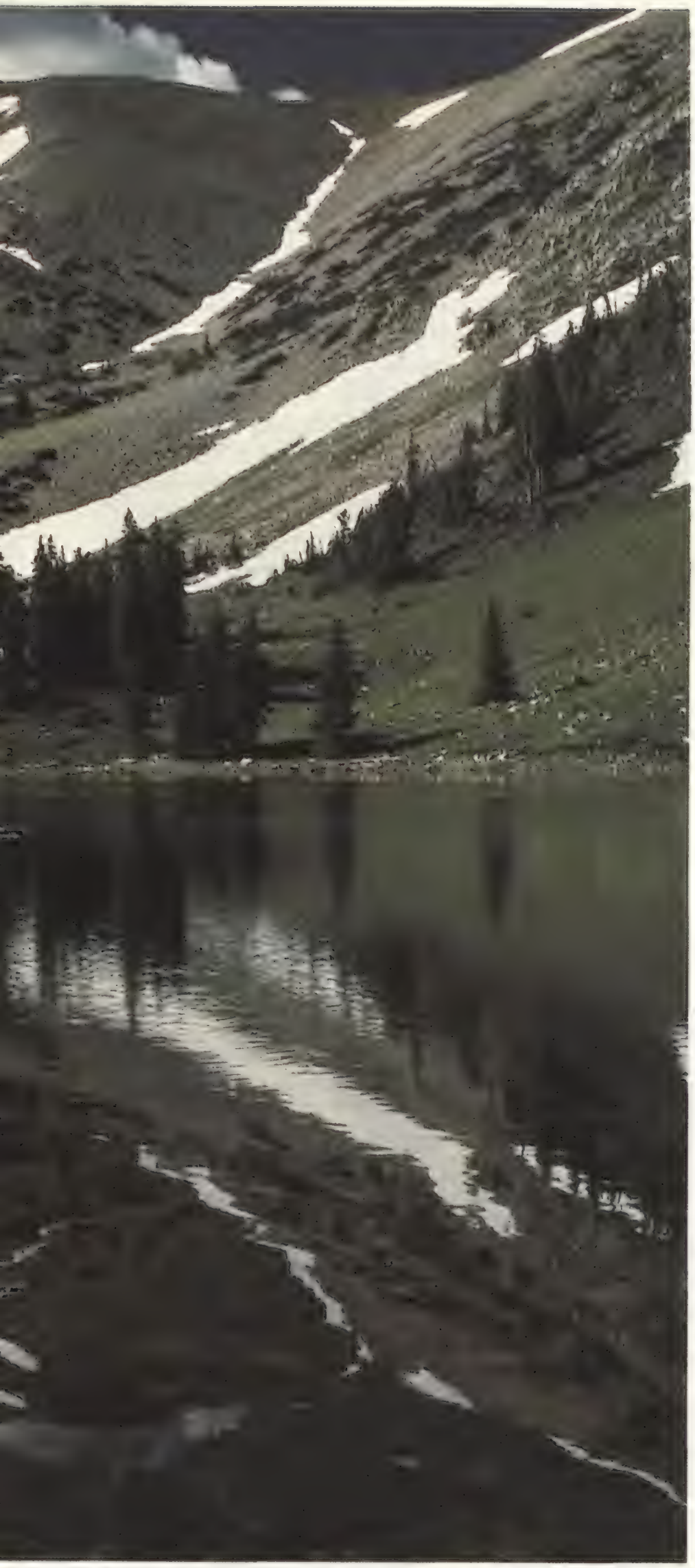
It occurred to me as we slogged back up the slippery grade that this grove of eminent survivors, froghair-fine as it was, was not about to be inundated any time soon with visitors. Few would chance the road, and fewer still would wish to strengthen their character on the gravel slope. Nevada is hard country, short on amenities and not to everyone's taste, and Great Basin Park is no exception. Hendricks scowled as he plucked a candy wrapper from the ground without breaking stride. He eyed the sky. "It looks like we have a regulation rainstorm all around us," he announced. "We don't want to be up here if lightning's coming." An hour later we were zigzagging down the road built 40 years ago by a miner I would later meet, named Shirley Robison (p. 74). Surprisingly, it was a summer Sunday in the new park and yet we had seen no other creatures on either the mountain or the road save a single flustered jackrabbit.

The Great Basin, which includes almost all of Nevada and parts of the neighboring states, stretches from the Sierra Nevada Range on the west to the Wasatch mountains on the east. Defined by the peculiar fact that its few waterways drain not into the sea but into its desert flats, it is the loneliest, least-known and least-appreciated geographic province in the West. The tensional stretching and uplifting that marked its geologic history fashioned a landscape characterized by an unrelenting progression of north-south ranges broken by lonely desert basins where scrawny rivers vanish into sinks that confounded and dismayed the westering pioneers. This is a kind of American outback, a Big Lonesome roamed by pronghorn antelope

Fluted formations develop as water deposits minerals.

Deteriorating cabin is one of several in abandoned mining complex on the slopes of Mount Washington.

The glassy surface of Stella Lake reflects patches of snow on Wheeler Peak. The lake was formed by glacier that gouged out basin, deposited rocks. Fed now by melting snow, it freezes in winter and contains no fish.



Even though it is 10,400 feet high, the picturesque tarn is relatively easy to reach from road a mile away.

and mustangs and jackrabbits, a place where seeing another car on a remote road produces the same cheering sensation as spotting another ship on an ocean voyage.

With the exception of such widely separated urban oases as Las Vegas and Salt Lake City, the human overlay here amounts to little more than tentative scratchings on the land, patches of hopeful green on the vast and ubiquitous brown. Distances telescope, 100 miles looks like 20, and biological diversity normally increases with altitude—scientists call this "vertical zonation." Anything that survives, from trees and plants to animals and people, has to have an adaptability coupled with grit. Plants are often equipped with hardy stems and elaborate root systems that enable them to withstand the stresses of cold and aridity, and rural Nevadans are frequently as crusty and self-sufficient as other basin species.

Most of the few hundred Nevadans who live in the Snake Valley, which adjoins the park, share a characteristic suspicion of governments, outsiders and radical change that makes them almost reflexively hostile to the idea of a national park in their backyard. They have adapted to remoteness. Private telephones are only a decade old in the valley and mail arrives three times a week; the closest doctor is about 70 miles away in Ely. It is no accident that Nevada was, until the establishment of Great Basin Park, the only Western state lacking a national park. Disagreement persists locally even now over whether the new preserve is "national park quality" and whether vacationers who come by the vanload will cotton to its harsh and often glorious attractions.

The establishment of the park in fact reflects an idea that has been ascendant in the National Park Service for years, the belief that each major ecosystem in the country should be represented by a park. Shenandoah in Virginia and Gates of the Arctic in Alaska, like the Basin park, illustrate the best of their distinctive physical and biological regions. "A national park doesn't need geysers or the Everglades to be a magnificent place," Hendricks explains. "Parks should also represent the significant resources and habitats of their area, and this is as good as the basin-and-range ecosystem gets."

If Yellowstone and Yosemite are diamonds in the nation's diadem of parks, Great Basin Park is perhaps more like a piece of turquoise. With the exception of Lehman Caves, a cavern whose intricate and beautiful decorations qualify it as a natural marvel by any standard, the park does not so much overpower a visitor, the way the Grand Canyon does, as creep up on him.

Donald Dale Jackson spent considerable time in the Great Basin while working on a book for the Time-Life Wilderness series, Sagebrush Country.

The bristlecones, the deceptively high peaks (topped by 13,063-foot Wheeler Peak, Nevada's second highest), the steep-walled glacial lakes and narrow canyons command an appreciation that only gradually—but steadily—shades into awe.

The park's appeal has to do with silence and space, with the grand lonesome sweep of the country itself, with long vistas and clear air and sudden winds that roar like a locomotive and secret meadows jammed with wildflowers. Bold colors blaze amid the dun-brown ridges—the iridescent flash of a western bluebird's wings, the ghostly white of an aspen trunk, the fierce dark green of a manzanita bush. Eagles and hawks idle over ravines where mountain lions stalk mule deer. Five distinct plant zones parade up the rocky slopes of peaks from the gray-green sage and stunted, shrublike junipers on the valley floor, through aspen, mountain mahogany, pine, spruce and fir, to the alpine plants above the treeline.

I passed through several of these vertical life zones one morning on a seven-mile hike up Baker Canyon, a lush and verdant defile on the east side of the Snake Range that tops out at 10,600-foot-high Baker Lake. My guide, a long-legged ranger named Mike Nicklas, fussed about the cattle that graze in the canyon's lower end—a concession to local ranchers—and expressed a preference for wilder critters. "You want risk in a place like this," he said. "I like things that can bite you and chew you up, rattlesnakes and mountain lions." Nicklas also likes to pack into the high country alone in winter on cross-country skis.

He pointed out an intersection of plant zones: mountain mahogany and piñon pines, the source of the nutritious nuts that sustained the original Indian settlers in the valley, climbed one side of a narrow draw, while aspen and stately Engelmann spruce clustered on the other side. Many of the aspen trunks bear inscriptions carved by Basque sheepherders—"Antoni Vera, 5-39," one reads. A sage hen and three chicks bustled indignantly out of a trailside shrub. Blue and red penstemon, mountain bluebells and Indian paintbrush filled a perfect meadow, a tiny paradise of splashy color beside clear and clattering Baker Creek, where a water ouzel did squat-jumps on a log.

"The basin is one of the last frontiers of wilderness in the lower 48," Nicklas said as we came in sight of Baker Lake, a glacial tarn that lies at the base of a 500-foot-high cliff with a column of spruce marching across its rim. "We had to protect part of it." Patches of snow lingered in the draws above us. The lake lay still and shallow beside a meadow as green as a suburban lawn. The gravel triangle of Pyramid Peak loomed behind us. "I hope we don't overdevelop this park," Nicklas added. The line of spruce gave way to the highest plant community, the sturdy little flowers that poke impudently from bare rock. It was difficult

Wayne Gonder, one of the main stockmen in the area, works his cattle near the Baker Creek campground, where his trailer (top) is parked. Shirley Robison (right) lives on ranch not far from the homestead where he grew up. In late 19th century, his father worked for Gonder's dad.

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Steep talus slope on the way to 13,063-foot Wheeler Peak is still partially drifted over in mid-July; some snow and ice will remain all summer long. Wheeler Peak juts up on the right. Jeff Davis Peak is on left.

to imagine the idea of development, much less overdevelopment. The sense of peacefulness was absolute. In a few minutes, much too soon for both body and soul, it was time to leave.

Baker Canyon and the Snake Valley have always been a few hundred miles distant from the American main line. "My granddad came into Snake Valley in 1873 with three pigs," 68-year-old Shirley Robison recalls. "He went to cutting timber when he was 13. He took a quarter of beef with him up a draw one time and a lion dragged the whole thing off without even leaving a dang mark. We were one of the first families in this country." Born in the shadow of snaggletoothed Wheeler Peak, Shirley worked cattle on the family ranch and later became a miner and a brand inspector.

"Oh, we had some times in those mountains. My brother Earl and I once took some groceries to a sheepherder up Strawberry Creek when we were boys. Our dad told us to stay away from this one ranch where a woman lived by herself. She'd said she would kill any man who came on her property. Well, don't you know Earl and I stumbled onto her place and she yelled at us. We thought we were killed for sure. She asked who we were and what we were doing and damned if she didn't bring us homemade bread with cow's cream and sugar. Didn't kill us at all. I found out later that she didn't care for men because her two brothers had tried to take her place after her husband died."

Shirley's family and the other early settlers ran cattle and sheep, planted orchards and hacked at the rocks for lead and silver. Rancher George Baker gave his name to the tiny village that still lies at the foot of Wheeler Peak like a pale green puddle. An enterprising forty-niner named Absalom Lehman discovered the cave—the story is that he fell into its narrow entrance while astride his horse and that man and mount needed four days to get out—and promoted it as a tourist site. It became a national monument by proclamation of President Warren G. Harding in 1922.

Visitors turned up occasionally, but the Snake Valley remained home to only a few self-sufficient ranch families and a wavy ocean of sagebrush. A short-lived attempt to add Wheeler Peak to the monument died quietly in the 1920s. The U.S. Forest Service managed the bulk of the range, permitting grazing and mining and eventually building campgrounds and rough trails. Darwin Lambert, a newspaper editor in Ely, led a campaign for the park in the 1950s. The Forest Service responded by designating a large tract as Wheeler Peak Scenic Area. Ranching and mining interests, tra-

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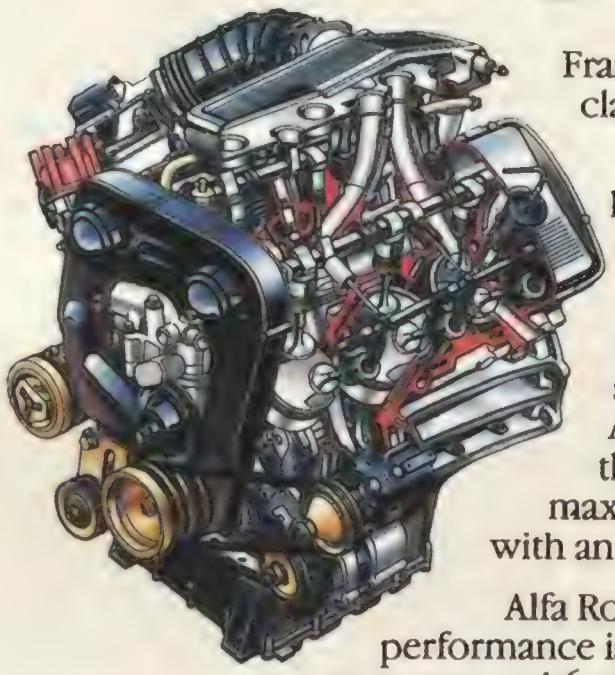

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ditionally the economic powerhouses in the Silver State, beat back the park proposal.

"The Park Service was talking about outstanding areas representing each major geographic province even then," Lambert remembers. In the 1970s, the agency studied five Nevada ranges as possible sites and zeroed in on the Wheeler area as number one. In those years, the park idea's most persistent proponent was Robert Starr Waite, a geographer at the University of Utah. Waite was the author of a controversial dissertation on the area, and he crusaded long and hard for a park. "It was blood, sweat and tears all the way," he recalls. "At one hearing a rancher grabbed my shirt and shook me till his eyes bugged out. I was finally beginning to make some progress when the MX missile proposal came up, and that stymied me." This was a Pentagon plan, later abandoned, to base mobile MX missiles in the Snake Valley. The locals weren't keen on that idea either.

A change in the political climate

The final push for the park began in late 1985. By then the economic picture in Nevada and elsewhere in the West was changing: mining anything but gold no longer paid, and the ranchers' clout was ebbing; tourism was Nevada's new ticket to prosperity. The political climate was also changing. Environmental causes were becoming increasingly popular in Reno and Las Vegas, where the Nevada votes are, and Senator Harry Reid (then a Congressman) emerged as a spokesman for the state's conservationists. Reid proposed a 174,000-acre national park and preserve, then Senator Paul Laxalt suggested 44,000, the mining and ranching lobby flailed away in futility, and a compromise 77,109-acre park was the result. "Creation of the park was really a stroke of luck," says a Park Service staff member who chooses to remain anonymous. "It wasn't established for conservation reasons alone but for business reasons as well. As a matter of fact, conservation was almost an inadvertent result, a by-product. But considering that, we made out a lot better than we might have."

The local ranchers who led the opposition also made out reasonably well. They are allowed to graze cattle on park land indefinitely, a departure from the standard policy of setting a phase-out date for grazing permits. Since park campgrounds are unfenced, this raises the possibility of nose-to-nose confrontations between campers and 2,000-pound bulls—but some locals suspect that the tourists' real concern will likely be the animal's other end. "If we could build a manure-free cow I expect we'd eliminate the problem," rancher Dean Baker says. Baker (no relation to the town's founder) was startled to discover that the park

Deep hues of Parry's primrose gleam among rocks in the middle of a spring-fed stream below Wheeler Peak.

The flower's rank odor is often likened to that of carrion but its brilliant color endears it to hikers.

employee assigned to administer grazing permits is both a woman and a vegetarian.

Thus far the boots-and-saddle forces and the rangers in their Smokey hats have maintained a wary truce. "I want to go easy," Hendricks says. A Park Service management plan that will spell out the recommended changes—improved roads and trails, protected areas and the like—will take three years to complete and several more to implement. So far, the looks and character of the place have not changed much except for the sign at the entrance and the addition of a few "pitch in" trash-disposal markers. Visitors are still allowed to camp just about anywhere and many of them discover that exploring the sometimes-invisible trails is still a daunting exercise.

Many of the park's former foes have grudgingly decided that maybe they can coexist with it after all. "I guess we'll just have to make the best of it now that we've got it," rancher Wayne Gonder says. "The park took away my dream," Shirley Robison complains. "There's beryllium and other ore there, lots of it. But I'm going to try as hard as I can to live with it."

Those who expected a bonanza of tourist dollars with the park's creation—Waite predicted an eventual total of half a million visitors annually—are still scanning the dusty horizon for the telltale glitter. Visitation was up by more than 40 percent in the first seven months of this year, and business in Ely motels increased 20 percent over the same period, but those numbers are deceiving. The total number of park visitors last summer was only about 35,000. The park offers a limited menu for vacationers, primarily touring the caves, camping and hiking the rugged backcountry trails. The snowmelt lakes do not invite swimming, and fishing is chancy. "This place is a little scary for tourists," says Joe Griggs, a seasonal maintenance worker in the park and a longtime Baker resident. "It's a long way from the kinds of conveniences many of them want."

Trading ranchers for tourists?

Incorrigible Nevadans like Dean Baker and Shirley Robison are concerned about the survival of what might be called the Nevada character. They suspect—with some historical justification—that the Park Service will eventually end grazing on the park's land. Joe Griggs regards these die-hard Nevadans as "a kind of American standard. They're honest, they work 14-hour days, they share with each other, they're not afraid of anything and they're not out to rip anyone off. If we go from an agricultural economy to tourism, they'll be gone. To me, exchanging ranchers for tourists is a bad trade."

Darwin Lambert, the former editor and longtime

Pulling a stunt that's not recommended by rangers, naturalist Alvin McLane waves atop Lexington Arch.

park proponent, puts the ranchers' case in a longer perspective. "Grazing gives the park the flavor of the basin," he says. "It's part of its history. The basic culture of an area should be permitted to flavor natural conditions as in fact it always has. There's no perfect wilderness. Wilderness results from Man's decisions."

Al Hendricks holds a different but equally worthy conviction: "The park will be here forever. It's not a value to you or me personally but to the country. Parks aren't created to maximize business opportunity, they're for the enjoyment of everyone and the protection of resources, and it's my responsibility to manage that way. Great Basin Park is *national,* it's not just for Nevada."

On my last day in the park I hiked up another muscle-toning trail with my longtime Nevada friend Alvin McLane and Alvin's friend Mary Winston. If Alvin were political he would belong to the Lonesome Polecat Party, and its emblem would be a hiking boot rampant on a map of Nevada. Alvin is an archaeologist-hydrologist-botanist-mountaineer-caver-historian-explorer with a few other outdoor hobbies on the side. He works when he must at various jobs in Reno, but only those that compel him to trudge around the Nevada outback. Nevada is Alvin's turf; he knows it the way the Paiutes and Shoshones did; he once aspired to climb the highest mountain in each of the state's several hundred ranges. Traffic, crowds, people wearing guns and Sierra Club hiking parties ("They won't let you pass") alarm him. Once taciturn in the Western manner, Alvin now occasionally strings three or four sentences together, usually preceded by "Oh, look!" and followed by a cloud of dust. He may be the quintessential Nevadan. I wanted his opinion of the park. "My idea is preservation without categorizing," he said as we set out. "It's here, and you're not making it prettier by calling it a national park."

Lonesome Polecat names an arch

Alvin specializes in discoveries, and he made one even before we reached the trailhead—a small arch he promptly climbed to, explored, analyzed and named Firecracker Arch for the firecracker penstemon flowers we found there. Our destination was another arch, called Lexington (left), which Alvin once measured at 70 feet high by 83 feet wide. When I asked him why he measured it he looked at me as if I had inquired why he breathed. "Because I wanted to know its measurements," he explained.

He exploded in "Oh, look!" a half-dozen times as we scrambled up the trail—a rare flower, an interesting rock, an Indian pictograph site. I caught an occasional breather on the pretext that I was taking notes. "What I always liked best about this place is that you could go anywhere. No regulations. I just like being an explorer," he shrugged. A frown clouded his ruddy brow. "Any development in here would bother me. When you're a lonesome polecat you have to have country like this where you can be totally alone, throw your bedroll down and just *be* there."

The arch now loomed directly above us, a great blue tunnel in the dun-hued limestone. Scale in this country is such that you're not certain of an object's size until you're next to it. This was a goliath among arches. The trail faded. Another steep, slippery, gravel slope lay between us and the arch, and Alvin was already halfway up and waving his arms, apparently to purge himself of excess energy. Mary followed him to the top, and I puffed up an eternity or so later. Alvin darted around discovering things—sure-enough pictographs, for one. They were fingerprint-size red smudges on a hidden section of the arch wall. "It would be an obvious place for the Indians to do it,"

he said. "They used animal fat and ocher. Who knows what they mean? It could be lots of things. Wow!" he cried joyously. "That's two discoveries already today." Birds zoomed through the arch like renegade fighter pilots. A lime-green hillside bulked beyond the arch, with a red blur moving across it. It was Alvin.

When we later paused for lunch on the way down the slope I dropped a grapefruit, which instantly hurtled out of sight and vanished into Lost Grapefruit Canyon. The wind kicked up, sounding like a 747 revving up for takeoff. A hawk rode the current. Soon afterward Alvin made another detour, this time plunging into a chokecherry thicket in search of rock art on a nearby cliff. "Are you all right, Alvin?" Mary called. "I don't know," came the reply, "am I?" "Stop that," Mary snapped. He reappeared a few minutes later. "That was a 5.10 in bushwhack difficulty," he observed.

The Lonesome Polecat's perspective is of course selfish: he wants Nevada to remain as undisturbed and unpopulated as possible so that he can continue discovering things and saying "Oh, look!" His larger point is that there was no particular threat, real or potential, to the Wheeler Peak area. The place had in effect preserved itself—it was there for those who could cope with it and appreciate it. "Make it a park and people come," he said darkly. "You get cited for barking a tree or picking flowers. Why, I once had to wait 45 minutes behind traffic on a switchback road in Canyonlands Park." It was not an experience he wished to repeat. For reassurance he maintains a secret file of a couple hundred Nevada hideaways that are known to nobody but him.

Alvin was unenthusiastic about stopping by park headquarters, but I wanted him to meet Nicklas, who, like him, is a mountaineer. On the way down the long hill to Baker we saw armed rangers stopping motorcyclists on their way into the park. It was the Fourth of July, and hundreds were due at one of the campgrounds. A special law-enforcement squad from the Park Service's Denver office had been summoned to reinforce the local rangers. Alvin's eyebrows rose. "Did you see those *guns*?" he shuddered. He was silent for several minutes. "I don't know about this place now," he said finally. "It doesn't feel right anymore."

Rain clouds gather east of Wheeler Peak, obscuring the hills of Utah on the horizon. The cairn piled up by hikers over the years is of quartzite rocks that impart flinty character to landscape and inhabitants alike.

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By Judd Tully

Sydney and Frances Lewis—the quest for the best in art

After a tentative start some 25 years ago, the Richmond couple, founders of Best Products, gained momentum and expertise

In the early 1960s, Sydney and Frances Lewis of Richmond, Virginia, attended an auction in New York with their friend painter Theodore Stamos and bought—at Stamos' urging—an anonymous French chest and a pair of side chairs. At the time they had no idea their spontaneous purchase would lead them into an entirely new field in their more than 20-year bout of collecting fever. And into an accumulation of art that would ultimately require a new wing back home at the Virginia Museum of Fine Arts.

"I was intrigued by those lines," recalls Sydney Lewis of that first piece of Art Nouveau bought at auction. "I can speak for me. I can't speak for Mrs. Lewis." Before his next sentence emerges, Frances Lewis affirms "Absolutely, absolutely," and charges seamlessly into the conversation. "Now stop me if I'm wrong," Mrs. Lewis challenges with the arch of an eyebrow, "but we started collecting, for furnishing our house, like everyone else around here with 18th-century English furniture, buying at auction, mostly in England. That lasted about two years."

Interviewing the Lewises together at home or in their offices at corporate headquarters, one grows accustomed to getting compound answers to single questions. A longtime friend of the Lewises puts it this way: "SydneyandFrances is definitely one word. They kind of flow together."

The Lewises are something of a down-home Medici family, keen on bringing the latest expressions of culture to the public. Their ability to do so has been

Philanthropic Lewises are quite at home in new wing of the Virginia Museum of Fine Arts, Richmond.

At right, a Frank Stella painting captures young viewers; the sculpture at left is by Robert Arneson.

fueled by the fantastic success of their showroom-catalog enterprise, Best Products.

The beginning of Best Products Co., Inc., couldn't have been more modest, the success more monumental. It was started as a mail-order operation in 1957 with a catalog printing of 1,000 and a warehouse from which to respond to hoped-for orders. The orders came, eventually in flood proportions. Last year sales hit $2.2 billion. Eleven million catalogs were mailed, keyed to a network of 200 stores in 28 states; total showroom space is more than 5.7 million square feet, with that much again in warehouse space. The name came from a what'll-we-call-it session between Sydney and Frances, who concluded that there couldn't be anything better than best.

A dizzying array of giving

To the colorful history of Mom-and-Pop ventures, Sydney and Frances added an undreamed-of dimension. Then, fueled by the generous proceeds, they began a dizzying array of giving: a $9 million gift to Washington and Lee University (Sydney's alma mater) to build and endow a new law school center, Lewis Hall; $2 million to help establish Eastern Virginia Medical College near their summer home in Virginia Beach; a more "modest" outlay of $100,000 to the Virginia Museum of Fine Arts to buy the latest in contemporary art.

Their commitments to education and culture culminated in December 1985 with the opening of the $22 million, 90,000-square-foot West Wing of the Virginia Museum of Fine Arts. The Lewises not only pumped in $6 million but donated two fabulous collections of art, most of which, until then, had resided in their home. Their coequals in the creation of the wing, the Paul Mellons of Upperville, Virginia (SMITHSONIAN, April 1983), matched the Lewises' pledge and presented the museum with a select range of French Impressionist and British sporting paintings. The Commonwealth of Virginia committed $10 million to the building fund.

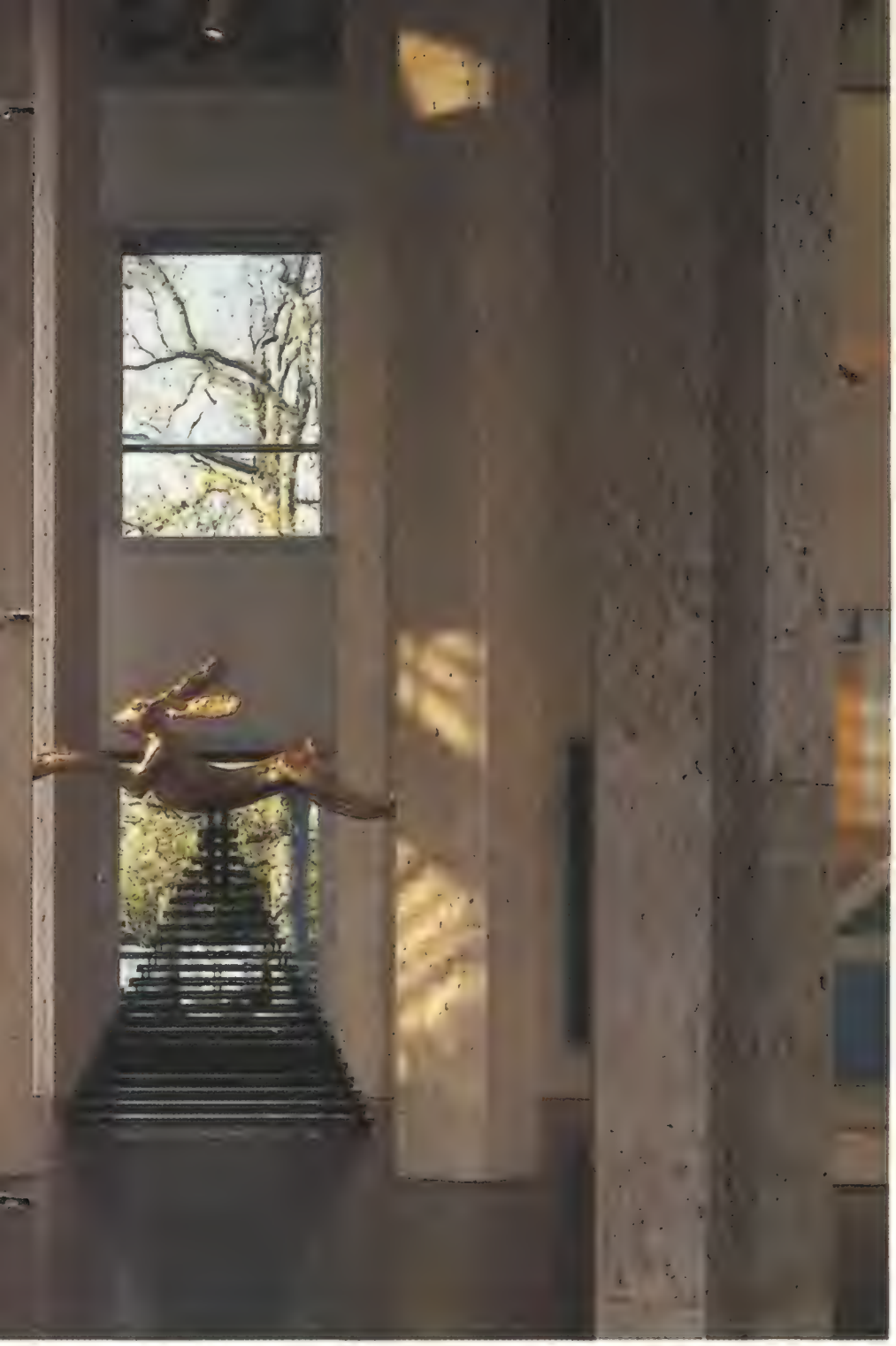
Although Sydney jokes that "I've given all my money away," the Lewises remain peripatetic patrons of the arts. While Frances is active with the Virginia State Board of Education, Sydney commutes to New York and Washington where he serves as a board member of the Brooklyn Academy of Music and chairman of the trustees of the Hirshhorn Museum and Sculpture Garden. Although they've retired from the auction circuit (for the most part), their quest for contemporary art and furniture takes them to galleries and studios in New York, California and Italy.

Sydney Lewis freely confesses that collecting is a disease, "although a pleasant one." Since they began

Lewis Contemporary Galleries in the West Wing include Barry Flanagan's bronze *Large Leaping Hare.*

collecting, the prices of Art Nouveau and Art Deco objects have skyrocketed on the international auction circuit (one of Tiffany's rare Cobweb table lamps from 1902 that sold at auction for $40,000 in the mid-1960s fetched $360,000 at Christie's in 1980). The same goes for many artists represented in their vast contemporary collection. Their ingenious solution to high prices was to buy jukeboxes, beautiful vintage machines with exotic brand names like Rock-Ola. These jukeboxes line a long corridor at Best Products headquarters, stocky sentries guarding the art treasures within. In typical Lewis fashion, 28 of their finest machines were exhibited in September 1985 at the Baltimore Museum of Art. The opening party was a

Art critic and writer Judd Tully lives in New York, specializes in contemporary art. His article on Red Grooms appeared in the June 1985 SMITHSONIAN.



Only a small fraction of the Lewises' 1,200 paintings and sculptures can be exhibited at any one time.

sock hop, complete with a disc jockey spinning the familiar tunes.

Back in the early 1960s when Best Products was first booming, the Lewises were scrambling to accommodate the explosive sales of brand-name household goods at heftily discounted prices through a growing network of showrooms. The couple didn't have a moment to appreciate art, let alone purchase it. Their frenetic pace continued until Sydney suffered a coronary attack in 1962 at the age of 42. "My doctor told me," Sydney says, "I could die tomorrow, but if I decided to take care of myself, I could live to be 100. I decided to try for 100."

That brush with death dramatically altered the couple's lifestyle, and instead of cramming seven days' work into four, the Lewises "spent seven days doing what should have taken four." They began to frequent art galleries and museums. Before that turnaround, Sydney could not recall ever seeing a contemporary painting. Even though he grew up in Richmond, he rarely visited the art museum. As he succinctly puts it, "I was a jock."

"It was just three big blobs," Frances Lewis remembers, sketching them vigorously in the air. She is describing their first purchase of contemporary art, a Jules Olitski abstract gouache, purchased at the Richard Gray Gallery in Chicago for $300 in 1964. "We walked out with it and I asked myself, 'Did I just shoot the family fortune?' " They took it back to Richmond and had it reframed. If it had happened today or even 15 years ago, Frances would have had the artist-made frame conserved and not just thrown out. But while the Olitski was at the framer's she dreamed that he had cut off the bottom of the picture, including the signature. Unsettled by the dream, she called the framer the next morning and sure enough, Olitski's signature, the benchmark of just about any work of art, had been lopped off. "So we wrote Olitski," continues Frances, "and asked if he'd mind signing it again. We thought he would be upset." Olitski accommodated the request and signed his name boldly in pencil across the front of the painting. That personal interaction between collector and artist was a harbinger of things to come.

Guardians of taste were up in arms

Today the Lewis home on Monument Avenue is just a block away from the imposing Jefferson Davis monument, "erected by the people of the South in honor of their great leader." The columns of the memorial and the faded green statuary are an arresting counterpoint to the stately rows of landmark houses that line the tree-shaded avenue. It is no wonder that when the Lewises unveiled Claes Oldenburg's totem-pole-size *Clothes-Pin Ten Foot* in their driveway in 1974, the local guardians of taste rose up in arms.

Oldenburg's clothespin became almost as famous as President Davis' statue. After the war cries died down, neighbors grew so fond of the familiar household object—blown up, Pop style, in Cor-ten and stainless steel—that when it was temporarily removed to star in a sculpture show in New York, editors of the local papers pounded reporters' desks for hard news of the disappearance. The sculpture was recently moved to its permanent home, just a half-mile away, standing tall on the outdoor sculpture terrace of the new West Wing.

The Lewis home, a sober brick mansion in neo-Georgian style, is full of surprises. A visitor is met by a sweaty man in work clothes, clearly disgruntled and leaning on a rubber-wheeled hand truck. Only later does one realize that the wrinkled worker is a life-size figure by sculptor Duane Hanson (p. 93). To be inside the house is to be surrounded by what the Lewises' old

friend, realist painter Jack Beal, calls "beautiful clutter." Art and artist-designed furniture are scattered about—an absolutely label-defying array of fabrics, styles and images.

"They set things up so that each piece is in conflict but not chaotic conflict," Beal says. "The juxtapositions rock you back on your heels but it's good because it makes you look at objects more carefully."

Those juxtapositions have, in large part, been broken at the new West Wing, where the Lewis Collection of late 20th-century paintings and sculpture has been segregated from the Art Nouveau, Art Deco, Tiffany and harder-to-categorize decorative arts like the Charles Rennie Mackintosh high-backed armchair or the Harvey Ellis fall-front desk. Malcolm Holzman, architect of the West Wing (and partner in the New York firm of Hardy, Holzman, Pfeiffer and Associates), said that his biggest challenge "was to avoid sterilizing this rich mix." Thus there are many viewing points from the upstairs galleries—filled with decorative arts—that provide glimpses of the contemporary art in the galleries below.

Frances Lewis gets a "peculiar feeling" sometimes when she walks by some of the furniture installed in the marble-clad West Wing. "We lived with those objects," says Frances. "Now they're up on pedestals, under spotlights with signs that say 'Don't touch.' "

Although Sydney emphatically says "I'm a person who never looks back," he still gets wistful on passing Willem de Kooning's *Lisbeth's Painting* in the West Wing, so called because the artist's daughter had implanted her handprints in the wet oil (p. 95). De Kooning left the prints there and at the same time found a name for the work. "They haven't really left you, dear," sympathizes Frances. "Once you have them, you have the pleasure in recalling how you found

This is a view of the Lewises' Richmond bedroom before the furnishings were given to the museum.

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Jean Goulden's 1929 clock is Cubist in format, sculptural in presence. He gave up medicine for design. At right, Art Nouveau triumphs by Hector Guimard, who did Paris Métro entrances.

them, how you hung them." Sydney reenters the conversational flow: "These really great experiences remain with you because it was the friendships with artists here and overseas that gave us so much pleasure."

One such friendship was with the architect and designer Eileen Gray. She was 96 when the Lewises met her in Paris. "Did you come over on Twa?" asked Gray. It took a minute for Sydney to translate Twa to TWA. "No, Miss Gray, we came over on the wonderful Concorde." Gray immediately launched into a detailed conversation on the merits of the supersonic plane and revealed to the Lewises that she had been an aviator in her younger years and had once passed through Houston to participate in an air race in Mexico back in 1956.

As Sydney says, "She was a fabulous lady." He is particularly proud of their Gray holdings. His favorite is a fanciful floor lamp with a parchment shade from 1923, created for a bedroom-boudoir in Monte Carlo. The lamp, though, is pure sculpture, Cubist in design and handsome with sculptural tension. It stands at the prow of Gray's Canoe sofa fashioned of lacquered wood and silver leaf (p. 93).

The scope of the Lewises' gift to the Virginia Museum is mind-boggling. Frederick R. Brandt, the Lewises' onetime personal and corporate art curator and now the museum's curator of 20th-century art, tried to convey the richness of the works. Pointing to a superb mantel clock from 1917, a gorgeous black cube with numerals inlaid in ivory by the Scottish designer-architect Charles Rennie Mackintosh, Brandt said, "Most museums would kill for one Mackintosh. We have seven." Paul Perrot, French-born director of the museum, who assumed leadership during the West Wing construction, likens the museum atmosphere to "a bottle of champagne that's just been uncorked."

Only a small fraction of their 1,200 contemporary paintings and sculptures can be exhibited at any one time. Many artists are represented in depth and the names read like a roster of blue-chip stars, from Pop artists like Roy Lichtenstein and Andy Warhol to Abstract Expressionists like Mark Rothko and Franz Kline. There are also huge holdings in what is generally called realist painting. (A major missing link is Jackson Pollock, whose works the Lewises regret never having acquired.)

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The Lewises' quest for the best in art

A seminal moment in the Lewises' collecting career came in the 1960s when they met Ivan Karp, who was then director of Leo Castelli's uptown New York gallery—a showplace where reputations were made faster than art magazines could be published. Jasper Johns, Robert Rauschenberg, Andy Warhol, Roy Lichtenstein and Claes Oldenburg all showed there. Karp soon warmed to Sydney and Frances. "Sydney Lewis had an eclectic vision," he says.

The Lewises began a simultaneous love affair with the art and artists of New York and the splendors of European design. They religiously read the *Village Voice* and attended all kinds of experimental music and dance performances at the Judson Memorial Church in Greenwich Village. Soon the Lewises and the artists set up a kind of casual bartering system, with artwork being traded for commodities from the ever-growing Best Products catalog. Trading art for useful objects, even for medical and dental services, was not unheard of in those days and more than one fine collection of contemporary art was begun or added to in various exchanges. For Sydney, it began when he saw an ad in the *Village Voice*. It had been placed by Andy Warhol (in the days before his magnitude), who offered to exchange art for anything at all. At first he had wanted musical instruments and film, but he finally decided on a vacuum cleaner, among other things. In exchange, he would do a portrait of Frances.

Warhol met the Lewises in an amusement arcade on Broadway one afternoon and fed a stream of quarters, supplied by Sydney, into a picture machine that produced four-image strips. This process lasted about an hour and the result was hundreds of little photographs of Frances. One of them served as the model for a 12-section portrait. That first transaction was done on a personal basis. Sydney paid Best for the merchandise sent to Warhol. Later trades for the most part were on behalf of Best Products and the art obtained by them is still on display on various walls of Best headquarters and stores.

After the Warhol exchange, word went out in SoHo and, Sydney says, he was "assaulted with requests" for trades. Roy Lichtenstein asked for a refrigerator and other kitchen appliances. Jasper Johns prints were bartered for television sets, and Chuck Close, Jack Beal, Pat Stein and Robert Morris all ordered various household goods. As new appliances moved into grungy Manhattan lofts, paintings moved onto the walls of Best showrooms around the country.

With the continuing success of his company, Sydney Lewis found himself one of the wealthiest men in America; now it was time for philanthropy. In 1971, the Lewises made their $100,000 gift to the Virginia Museum and, of course, asked Ivan Karp to select the paintings. They established the Best Products Foundation under the direction of their daughter, Susan Lewis Butler. Active in the 28 states where Best stores are located, the foundation dispenses $1 million a year in support of the arts and higher education, with special emphasis on aid to teenagers.

Prodding the parties point-blank

Their approach to philanthropy was marked by characteristic Lewis style. They would call in the officers of a needy institution and ask them point-blank what they wanted. If the answers weren't imaginative enough, the Lewises would prod the parties to come up with a grander idea. And so when Sydney Lewis said "Is that all?" to Washington and Lee's request for a new law school building, the university officials thought it over and decided that a research-endowed law center would help too. (The Frances Lewis Law Center opened in 1979.)

The art collection was another matter. A number of topflight American museums lusted for the paintings and sculptures, but none of them had the capacity or the inclination to take on the decorative arts. The Virginia Museum couldn't handle them either—it was already filled to the rafters and in desperate need of space. That's when the idea of a new wing popped up and, between the Lewises and the Mellons, became a reality that doubled the museum's gallery space. Last June in recognition of their art patronage, the White House honored the Lewises by awarding them the National Medal of Arts.

Best Products headquarters, just north of Richmond on Route I-95, is something of a museum in its own right. Also designed by Hardy, Holzman, Pfeiffer and Associates, the building is surrounded by a moat and sheathed with a wall of tinted glass brick. Two Art Deco limestone eagles that once graced the Airlines

Above, Roy Lichtenstein's sculpture, *Lamp II*, and Duane Hanson's lifelike blue-collar workman.

The lamp above is by Eileen Gray, 1923, and the *Venus et l'Amour*, of ivory, by Emile Just Bachelet.

Canoe sofa, c. 1919-20, by Eileen Gray, one of the outstanding designers of the era, is similar to piece she did for apartment of Parisian couturiere Suzanne Talbot. Gray designed the entire Talbot apartment.

A gallery of highlights from the Lewis gift to the Virginia Museum

Work of Colombian artist Fernando Botero is now world famous. Above, *La Estufa* (The Stove), 1970.

German-born American painter Richard Lindner fled to New York in 1941. *Couple* (left) dates from 1977.

Mature work by Adolph Gottlieb, *Rolling*, 1961, was part of a series referred to as bursts. Gottlieb was a leading painter in the style that became known as Abstract Expressionism.

Red Grooms' *Matisse in a Garden* is one of several three-dimensional portraits; this is made of rag paper.

Former billboard painter James Rosenquist came to prominence in '60s; *Early in the Morning* is from 1963.

Holland-born master Willem de Kooning came to the United States in 1926; he did *Lisbeth's Painting* in 1958, so named because his daughter added her handprints in oil.

Johann Ferdinand Preiss depicted women in athletic poses, here *Breasting the Tape* in bronze and ivory.

Terminal Building in Manhattan serve as splendid guardians to the main entrance. Inside, in Frances Lewis' office, Sydney sits crosslegged, the picture of eclectic taste in a pink-striped shirt, black-and-white checkerboard tie and a muted cardigan resembling an abstract painting. Frances sits behind a blood-red lacquer desk designed by the Italian architect Gaetano Pesce—the kind of piece that is sometimes called "interactive sculpture." Behind the desk, incredibly, is a Cabbage Patch Doll with a birth certificate for one Sid Lewis—sent, Frances explains, by a worker from the warehouse.

Sydney speaks now of their gift to the museum. "We wanted to enjoy giving it away and not have our children have all the joy of doing it. We both sort of came to the idea at the same time. I really wanted to be part of the final disposition of these objects. But I couldn't do it if I were dead. That's what started me thinking."

"You made the decision in two minutes," Frances chimes in. "You just woke up one morning and decided. Just like you did when you decided to start Best."

"I was getting ready to say that," says Sydney.

Later, driving his temperamental sports car down to visit the museum, Sydney Lewis talks about his mother, Dora, who worked for Best practically from its creation in 1957 to just months before she died in 1984. Dora was a workaholic and always brought papers home in two big briefcases. Since she always worked in "accounts payable" and all she ever saw at Best were the bills, Dora warned Sydney weekly of the disasters facing the company. "She was from the old school," he says. "She'd spend $5,000 to locate a ten-cent mistake. You had to do things right, regardless."

Sydney navigates his electric-blue coupe (with the initials of his alma mater, W&L, on the license plates) into the driveway of the museum and, with the engine still running, unscrews his tall frame from the low-slung bucket seat. There is a young museum guard standing near the entrance. He notices the car and driver and asks his senior colleague who the fellow is. "Why, that's Sydney Lewis," huffs the elder guard, "he owns the place."

Sydney spies a group of young visitors and makes a beeline for them. He asks a wide-eyed youngster if he has enjoyed his visit, and after the boy's tentative nod, urges him to come back again.

One cannot help thinking that Sydney Lewis must have paid attention to his mother's words about doing things right—regardless.

Lewises' desks at home (hers in foreground) were lighted with Tiffany lamps; pieces are now in museum.

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BUCKLE UP FOR SAFETY.

By Dora Jane Hamblin

For Rome, riches and glory in an outpost of empire

It built, profited, withdrew from the ancient province of Arabia, leaving monuments now being reclaimed from the sands and restored

The sliver of land that is the Hashemite Kingdom of Jordan, only a touch larger than the state of Indiana, is today an island of relative stability in the mess that is the Middle East. Just about the last time it enjoyed this distinction was almost 2,000 years ago, when the Romans made it the orderly southeastern anchor of an empire that eventually stretched from Britain to Morocco, across North Africa to Turkey.

There was no Jordan when the Romans arrived. There was a vast expanse of desert loosely called Arabia, some abrupt mountains, a network of ephemeral streams called wadis when they are dry (which is most of the time), and a small stream that trickled its way from Syria to the Sea of Galilee to the Dead Sea: the River Jordan.

This might seem a strange place for the Romans to be, accustomed as they were to the fertile shores of the Mediterranean. But there were reasons. They were on a roll, and by taking what was to become the province of Arabia (eventually, but only in our time, Jordan) they could secure their boundaries against incursions from the powerful Parthians, Persians and marauding nomads, and be in a position to preempt the lucrative southern trade routes, then dominated by Arabs. And so they did what they did everywhere, as instinctively and industriously as Anita the Space Spider spun her web in the outlandish atmosphere of an early Skylab: they fortified, built roads, found and channeled water supplies. They bestowed colonnaded avenues, towering temples, vast theaters on small cities that lay along their path. The "Roman Jordan" that they created lies today in ruins the length and breadth of the little nation. Most of it is now visible and comprehensible, thanks to an enlightened government and the strenuous efforts of an international corps of archaeologists that notably includes the American Center of Oriental Research (ACOR) in Amman.

Even in antiquity, adaptive reuse: at Pella, Roman columns later defined a Byzantine church atrium.

The man who led the Romans was General Gnaeus Pompeius Magnus, better known as Pompey (106-48 B.C.). A consummate soldier who fought so valiantly in Sicily and Africa that he won a coveted triumph (a lavish procession into Rome) at age 25, Pompey was also alleged to be so shy that he blushed when he had to make a speech, and so handsome that one noted courtesan declared she could never part from him "without a bite." He became such a legend, in fact, that in the 16th century when fragments of inscribed stone turned up in the buried city of Pompeii, both the workmen and their noble employer thought the stone referred to the general, not to the city.

In 67 B.C., Pompey was sent to put down the pirates of Cilicia (now southern Turkey) who were preying on Roman grain ships, and was given command of all Roman fleets as well as power over all persons within 50 miles of the Mediterranean shores. He made such short work of the pirates that admirers back in Rome suggested he go ashore, take advantage of the existing power vacuum and organize the whole region as a Roman province.

A magnificent "rose red city"

Pompey took the ancient city of Damascus as easily as he had defeated the pirates, moved south to the area around the Sea of Galilee and from there went into Judaea, where he took Jerusalem. Despite the great antiquity of this part of the world, when Pompey arrived there was no native power except that of the Nabataeans, city-dwelling former nomads who had grown wealthy by dominating the caravan routes from India and southern Arabia to Mediterranean ports and thence Europe. From their central base in the magnificent rock-hewn "rose red city," Petra, the Nabataeans sallied forth only in self-defense, and not for conquest.

Apart from the Nabataeans there were mostly nomads, but waves of invaders had from time to time passed through and conquered, from Alexander the Great and his Macedonians to the Ptolemies of Egypt, the Seleucids of Mesopotamia, the Persians, the Par-

Photographs by Ara Güler

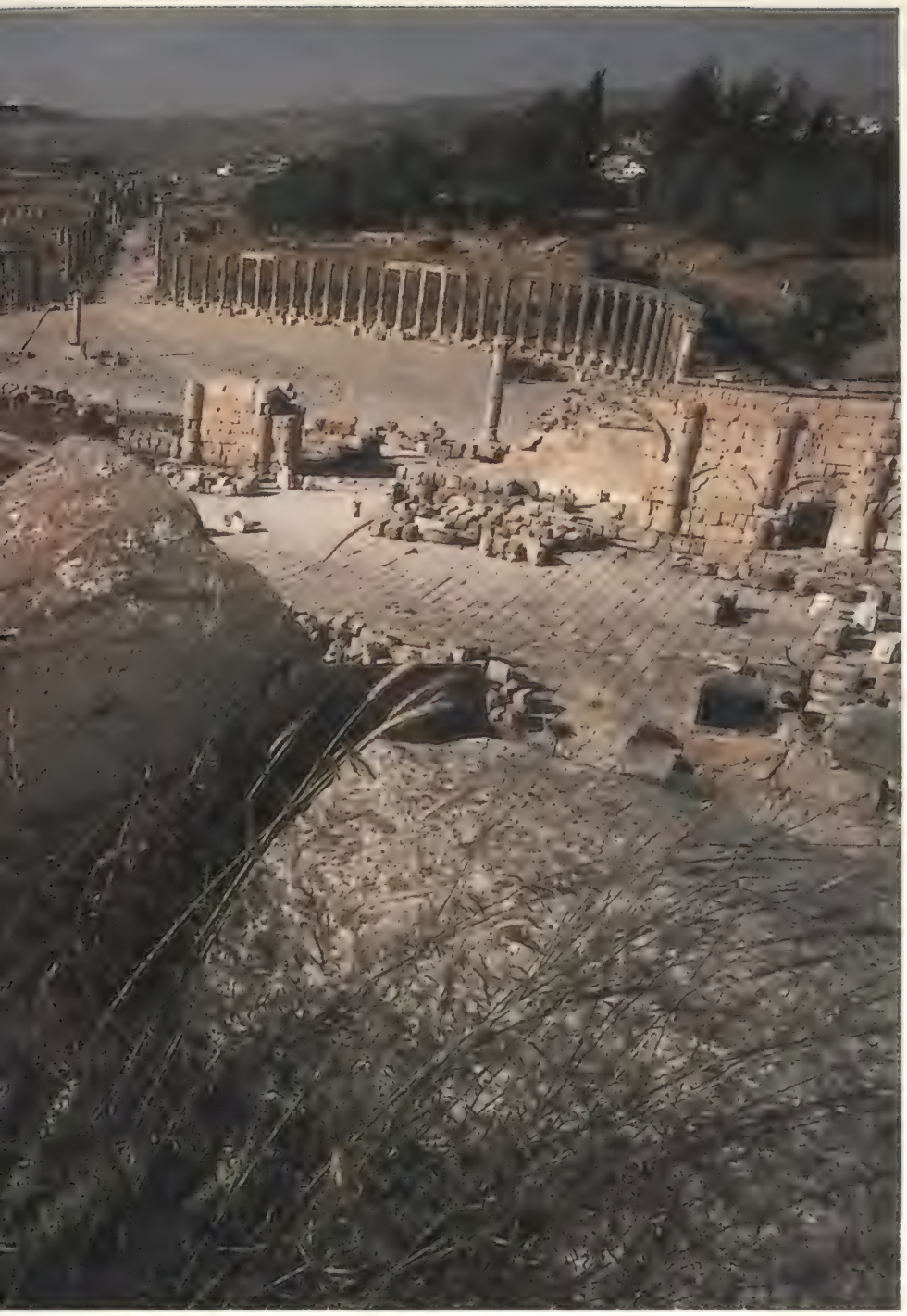
South Colonnade Street, Jerash: Corinthian columns fronted shady portico, were repeated across the way.

Ionic colonnade of the Oval Piazza at Jerash borders paving that once contained a central altar or podium.

thians, and an endless supply of squabbling kinglets from Judaea.

Pompey didn't threaten the Nabataeans and he won the gratitude of several ancient cities, the so-called Decapolis, by restoring their status as independent city-states under the loose aegis of Rome. Though later critics accused him of "parading himself like a Hellenistic monarch," Pompey was popular with the cities he liberated. They dated their currency, and in some cases even their history, from 63 B.C., the year of his passage.

The Decapolis is one of those enigmas loved and argued over by both historians and archaeologists. Early Roman writers and the Bible mention it, but there is no agreement on the precise list of cities or on its organization, if any. The name itself is simple; it means "ten cities" in Greek, and most scholars agree that they were either founded by or partially populated by the Macedonian soldiers of Alexander when he conquered the region in the fourth century B.C. After



At right, undergoing reconstruction, is the Temenos, a sacred enclosure leading up to huge Temple of Zeus.

On a hill south of Jerash, an arch honoring Hadrian was perhaps intended as centerpiece of new city wall.

Alexander's death, his empire was carved up, and his heirs fought each other up and down and across today's Jordan and Syria. The Decapolis knew no peace until Pompey.

As for the native Nabataeans, Rome was certainly not unaware of them and of their riches, but it made no move for almost a century and a half. Then came the emperor Trajan. An enormously talented imperialist, he decided to consolidate the Roman position by annexing most of the territory of the Nabataeans, from Bostra (now Busra) in the north—in today's Syria—to Petra itself and on to Aqaba on the Red Sea. Precisely how he accomplished this is not clear. Although he took the territory in A.D. 106, he kept strangely quiet about it for five long years. There was no public announcement until A.D. 111, at which time commemorative coins were struck and the former Nabataean holdings became the Roman province of Arabia. Significantly, the coins said specifically *Arabia adquisita* (acquired) instead of *Arabia capta* (captured).

Trajan had not been dragging his feet those five years. He had set his soldiers and minions to constructing one of the greatest roads in the Middle East, the Via Nova Traiana, which snaked for hundreds of miles from Aqaba to Bostra. Some of it followed an ancient track still called the King's Highway, its origins so lost in antiquity that nobody cares to guess who made it. Probably it was just a camel track, but Trajan turned it into an all-weather highway suitable for carts and armies, marked it off with milestones and linked it with subsidiary roads to the cities that lay off its main course. Parts of the road are still visible throughout the length of Jordan, but they are most dramatic on either side of the precipitous Wadi Mujib, Jordan's Grand Canyon, about 40 miles south of Amman. There, little arcs of masonry still cling to either side of the steep walls of the wadi, where two millennia of erosion have cut away their connections. They seem almost to float in air, and one can stand for half an hour in incredulity, wondering how the engineers and the soldiers not only dared to lay out such a road but then to go ahead and build it.

Easier to comprehend are the camps, forts and signal towers that Trajan's successors, particularly Diocletian, set up on the eastern edge of the desert to protect cities and settlements on the more fertile western side. An American team under the auspices of ACOR, led by Dr. S. Thomas Parker of North Carolina State University, has been exploring these fortifications

On first visit to Amman, in 1950, the author assumed her hotel, the Philadelphia, honored the U.S. city of that name rather than a pharaoh of ancient Egypt.

Qasr Bashir is best-preserved Roman fortification of central Arabia; lintel inscription dates it A.D. 306.

Corner tower, center, is 39 feet high; interior stairs that lead past second floor to top are still in place.

since 1980. Although many were consolidations of existing Nabataean strongholds, the greatest of them all is the fortress now called el-Lejjun (the name itself a clear corruption of the Latin *legio*, or legion), once home to the Fourth Mars Legion of Rome. In its heyday, el-Lejjun sprawled across 11 acres and included a complex of dams and water channels as well as agricultural lands that supplied a garrison of 1,000 to 2,000 legionnaires. Parker's teams have found and excavated barracks, complex walls and gates, and the *aedes*, or shrine of the legionary standards—where soldiers could also stash their savings. Near el-Lejjun is a Roman cavalry fort called Qasr Bashir, a towering square stone structure so perfectly preserved on the outside that it looks like a set for a Foreign Legion movie. Inside, it is in ruins, but the two-story bays that once housed horses, and the upstairs rooms for their riders, are still visible. The open center is now used by Bedouin as a sheep and goat shelter and reeks of dung, though probably no more than it did of horse manure in Roman times.

In 1982, Parker and his team manned 14 of the forts and watchtowers on the old *Limes Arabicus* (the empire's southeastern line of defense) and attempted to communicate with one another as the Romans had, smoke and mirrors by day and torches by night. The daylight signaling had mixed results, but at night "when the pinpoints of torchlight were visible for six miles, it was a haunting reenactment," Parker noted.

Roman Jordan's golden age began with Trajan but grew more golden under his successor, Hadrian, emperor from A.D. 117-38. One of the most-traveled rulers of all time, even known as the "first tourist," he was builder of everything from the Roman wall in England (SMITHSONIAN, April 1985) to Castel Sant'Angelo in Rome to the sprawling seven-square-mile Villa Adriana near Tivoli in Italy. Hadrian was a romantic, tall, elegant and restless, and he took an abiding interest in the province of Arabia. It was he who greatly improved Trajan's road, he who found Petra so evocative that he bestowed upon it his own name as honorific: Petra Hadriane. Hadrian made a long visit to the Decapolis city of Gerasa in the winter of A.D. 129-30 and the city, as host to the emperor and his enormous, money-bearing retinue, felt itself for a time to be the very heart of the Roman empire.

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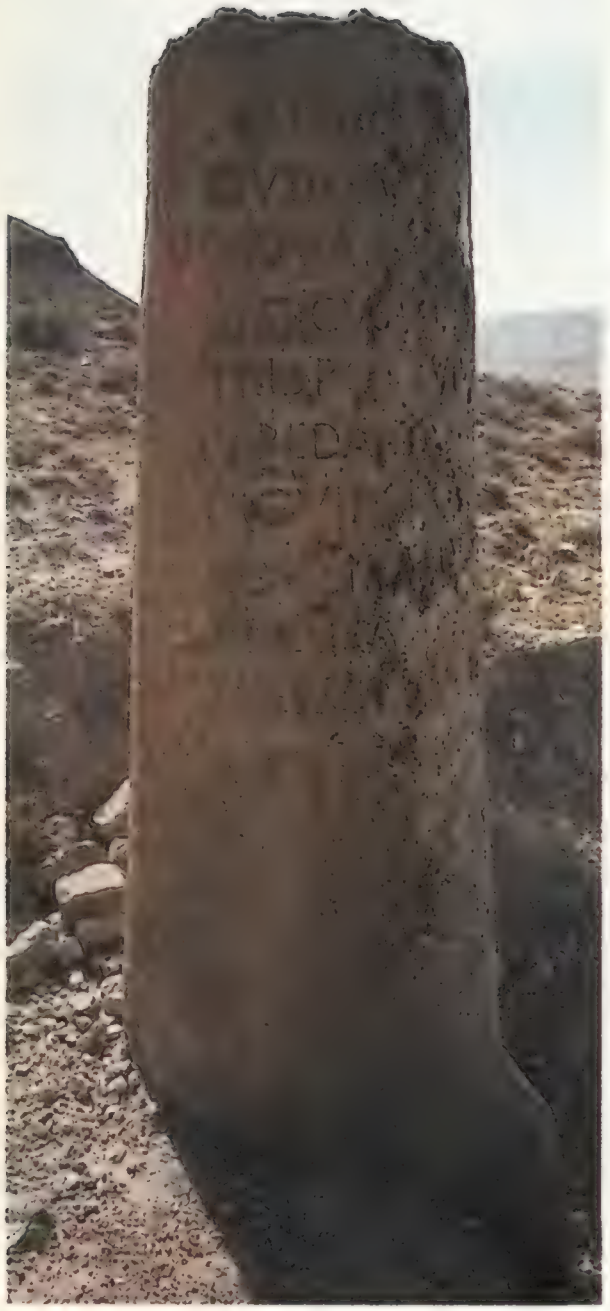

Milestones on Via Nova Traiana bore emperors' names, dates, other data.

Among the sculptures found at Petra, this harpy seems to display some of the malevolence ascribed to her in Greek mythology.

Gerasa, now called Jerash, is the most impressively Roman of Jordan's ancient cities and was in fact one of the three greatest cities of its era in the Middle East, the other two being Palmyra, in Syria to the north, and Petra. It began life as a small Hellenistic settlement, flourished after Pompey liberated it and reached its peak during Hadrian's visit, when rich and optimistic citizens built a monumental arch in his honor, which still stands.

Excavation and restoration of Jerash has been going on since the 1920s. Now the great temples of Zeus and Artemis are restored, as is the nymphaeum (literally "shrine of the nymphs," usually an elaborate structure full of flowers, statues, fountains and pools of water) and the vast South Theater, one of the most impressive in the entire Roman world. There is a long, straight colonnaded street running north to south and, most glorious of all, an oval piazza with embracing limestone columns—reminiscent of the Bernini colonnade at the Vatican but so much older and, it seemed to me, so much grander, bigger. Walking across the old stones, gazing up, up, up at the graceful columns, is to experience an almost tangible sense of serene grandeur (pp. 102-03).

In 1982, the Department of Antiquities of Jordan, headed by Dr. Adnan Hadidi, organized an ambitious international effort, projected for five years, to excavate still-buried sections of Jerash and to consolidate endangered ones. Funds ran out before all of the work was done, but teams from the United States, Britain, Australia, France, Poland, Spain, Italy and Jordan itself have cleaned and restored most of the major monuments.

After the golden days of Hadrian came the reign of Antoninus Pius. This emperor in fact seldom left Rome, but he took a personal interest in Philadelphia,

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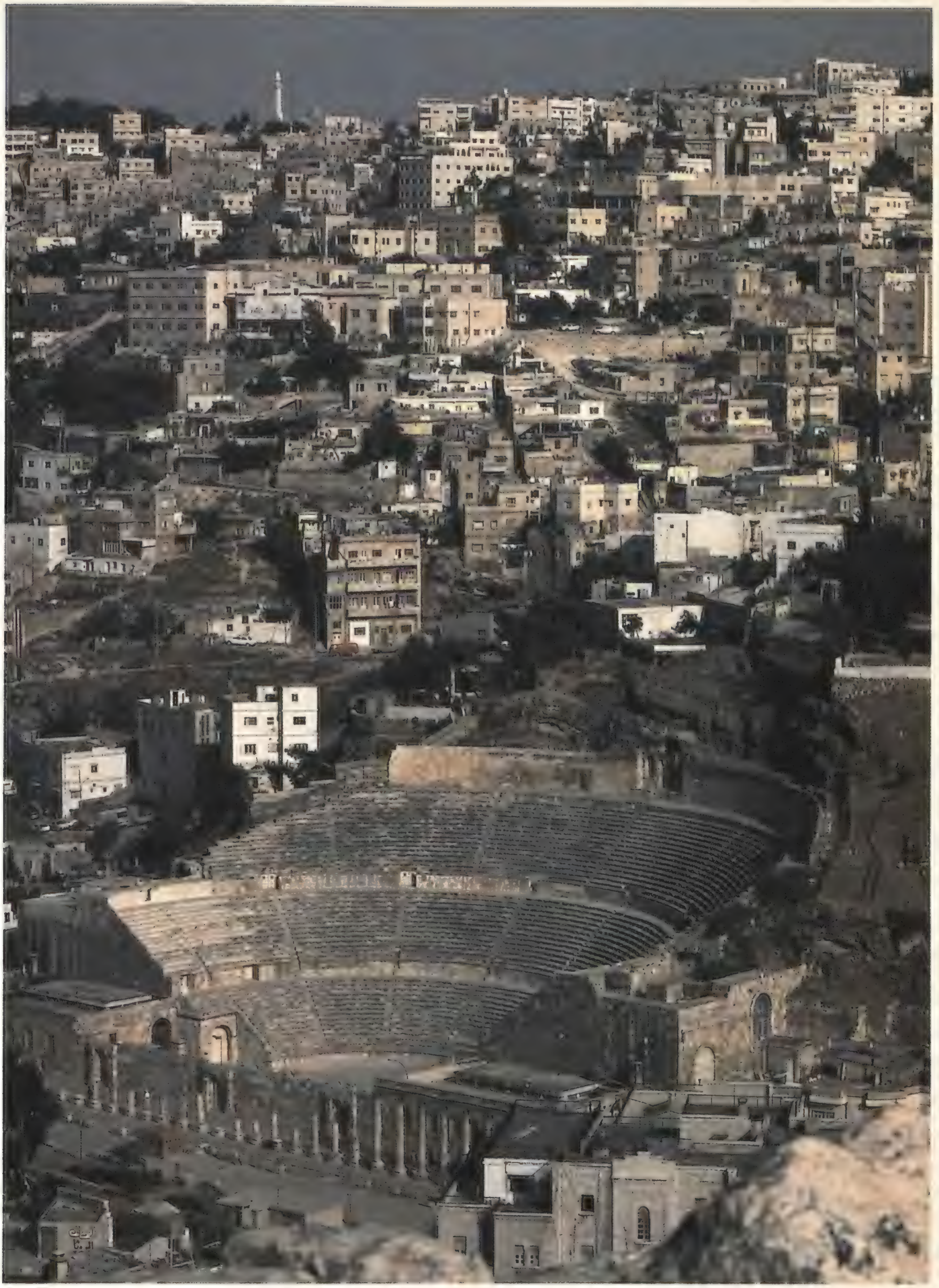
today's Amman, and ordered a vast theater for 6,000 persons to be built there. The city had entered biblical history as Rabbath Ammon, capital of the Ammonites. It became Philadelphia when the Egyptian ruler Ptolemy II Philadelphus took the city in 284 B.C. and bestowed his name upon it. It was particularly dear to the Romans because Philadelphia, like Rome itself, was built on seven hills. They rewalled an ancient citadel and built upon it a huge temple to Hercules, the ruins of which still brood over the present business district, Antoninus Pius' theater, a colonnaded forum and a little odeum, or covered circular theater. Until 50 years ago Amman still had the remains of Roman vaults over the river. In the explosion of growth that followed the flight of Palestinians from Israel in 1948-49, and the influx of international corporations and businessmen from war-torn Beirut, Amman has grown like a mushroom and many traces of antiquity have vanished.

For 600 years after Pompey, however, Roman legions kept order, Roman administrators did their duty, and the prosperous citizens built baths and temples, piazzas and fountains, theaters and monumental family tombs. Here, as in other outposts of the empire, the Roman presence was superior not in numbers but in power. The supreme commanders of both military and civil administrations would be Roman, and under them was one hierarchy of officers and another of bureaucrats charged with overseeing the tax collection, law enforcement, judicial proceedings, public works and so on. At all but the highest levels there would be local employees to interpret, explain local usage, advise. Manual laborers—street cleaners, bath attendants, stonecutters, water-bearers, drovers—were slaves or the lower order of indigenous people. The nomadic Bedouin stayed mostly out of Rome's reach, deep in the desert. But the security of Rome's chain of military fortifications made possible an agrarian prosperity enjoyed by the farming Arabs and other Semitic tribes of the fertile west—many of whom, in fact, sent sons to serve as legionnaires.

Days began at dawn and men worked hard, as was the Roman wont. Poor women stayed home to tend to housework and children; rich ones decked themselves to go calling or to entertain. And everyone who was anyone trekked off to the public baths, as much to

Sunset silhouettes ruins of a thriving Arab agrarian community, Umm el-Jimal, for which a nearby Roman garrison provided security. Arched double windows mark third story of the town's most luxurious house.



The Roman theater in Amman once seated 6,000; it has been restored and houses two folklife museums of traditional Jordanian crafts. Dwellings, most of them built since 1948, sweep up the steep hillside.

The area that was once the Roman province of Arabia, with some modern boundaries and city names for reference: Trajan's great road, the Via Nova Traiana, led from Aqaba on the Red Sea northeast up to Petra, Amman, Umm el-Jimal and Bostra. Auxiliary roads branched off to other cities and fortifications.

gossip as to scrub. The Roman passion for water, in fountains and in baths, must have come as a distinct shock to many in this arid land.

For amusement there were strolling street entertainers, rudimentary libraries and endless diversion in the theaters: plays, music, athletic games. If all this paled, there was always the street scene, a babble of languages and a profusion of costume. For here people spoke Greek, Latin, Arabic, and Palestinian Semitic dialects. Markets must have been a source of endless curiosity as human waves met and interpreters and scribes grappled with an international trade in perfume and spices, grain, camels and goats, gems and gold from India and southern Arabia, and textiles from Egypt. It would be naive to assume that there were no instances of tyrannical or unjust behavior, but by and large the presence of the Romans and the services and facilities they required brought wider outlets for the native populations, along with new techniques and new jobs. Some of the wealth did indeed trickle down.

Decline, which began as the power of Rome itself declined, accelerated in the sixth century, by which time Constantinople had become capital of the Roman empire. Arabia as a Roman province dissolved when the Arabs united under the new banner of Islam. The first clash between Byzantium and Islam, in fact, came in today's Jordan, in the early seventh century. The Muslims were defeated but they came back, and near the Decapolis city of Abila on August 20, 636, won a decisive victory. Abila has vanished into a serene and green landscape dotted with elaborately frescoed Roman tombs, but the nearby Decapolis city of Pella (Tabaqat Fahil on modern maps) demonstrates clearly the rise and fall of fortunes. Joint American-Australian archaeological teams have excavated 20 feet of successive habitation on the steep up-and-down site, from Neolithic to Bronze and Iron ages to Roman to Byzantine to Islamic, and have exposed a civic center with remains of a Roman theater, a grand staircase and several churches. At many other sites in Jordan the ruins of an Islamic mosque lie atop a Byzantine church atop a pagan Roman temple.

But devastating earthquakes and shifts in political power eventually caused the Muslim conquerors to fall away from the Roman cities. Sand blew in, weeds grew, miserable peasants camped out in the ruins or hauled away worked stones to build hovels. In the

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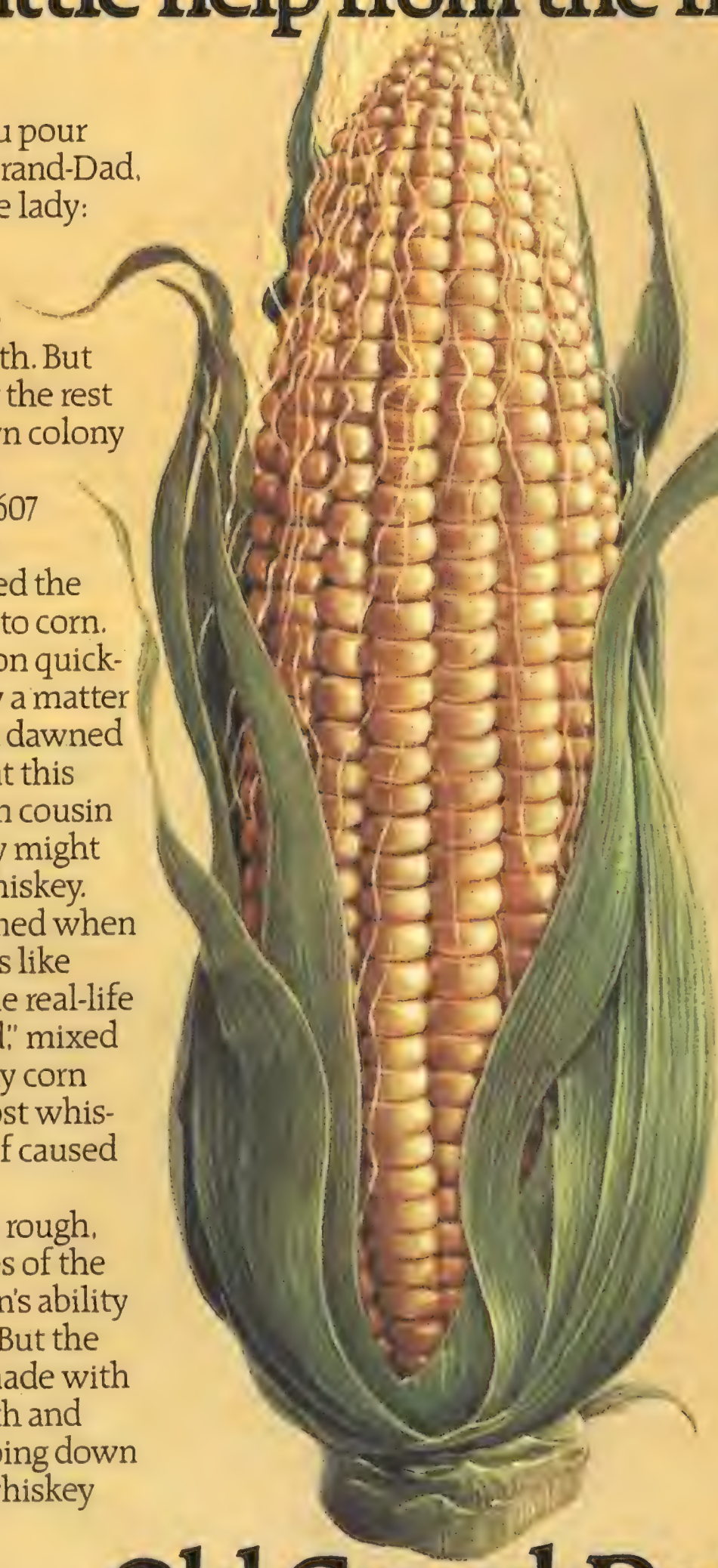

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Old Grand-Dad

HEAD OF THE BOURBON FAMILY

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Hellenistic-style facade, glimpsed through fissure in cliff, may have concealed a royal Nabataean tomb.

12th century, Crusaders en route to the Holy Land noted some of the remains, but by the early 19th century, this corner of the world, then a part of the Ottoman empire, was as unknown to the West as the heart of Africa or the wastes of the Arctic pole. The first Westerner to explore it was a German, Ulrich Jasper Seetzen, who in 1806 set out to find the cities of the Decapolis. The first one he found was Gadara; he knew about it from biblical accounts of the Gadarene swine. The story is that Jesus and some disciples, caught by a storm on the Sea of Galilee, put ashore in the country of the Gadarenes. There, a madman, possessed of unclean spirits, rushed out of a tomb and approached them. Jesus exorcised him by sending the evil spirits into a nearby herd of pigs, which promptly rushed down a hill into the sea and perished. The madman was cured, the disciples saved.

Ancient Gadara, now called Umm Qeis, is one of the most dramatic sites of Roman Jordan. Perched high in cool hills that are dotted in spring with wildflowers, it looks down upon the Sea of Galilee (now also called Lake Tiberias) to the west, and north toward the Golan Heights. The idyllic atmosphere is occasionally upset by glimpses of armed Jordanian soldiers who stop visitors for passport control and a usually cursory check of a car's contents. For this is a strategic corner, and travelers are acutely aware that near the Sea of Galilee and on the Heights there undoubtedly are Israeli soldiers keeping a sharp lookout.

Beneath a Gadara theater, "poetry in stone"

Gadara has been under excavation since 1974 by teams from the German Evangelical Institute of Archaeology for the Holy Land. Its workers have laid bare baths, the tall columns of a Roman forum, a Byzantine church, about 50 yards of fine colonnaded roadway and a stunning series of Roman barrel vaults that snake under an enormous theater. "Poetry in stone," one of its chroniclers has called the beautifully cut and fitted vaults. They and the theater itself are made the more dramatic by having been built of black basalt spewed out millennia ago by the volcanic Jebel Druz, across the border in Syria. No matter how many Roman theaters one has seen, the black one in Gadara evokes a gasp. A row of elaborately carved seats for bigwigs still stands nearest the stage area; in the center a headless white-marble Roman goddess still sits in startling contrast to her surroundings (opposite).

Almost as stunning, primarily because of the color itself and the remarkable hardness and tensile strength of basalt, is the site of Umm el-Jimal to the southeast. Here, the region's ancient corbeling technique, especially adapted to basalt, was improved by the Romans. Corbels, hacked from a quarry in 10- to 12-foot lengths, were cantilevered inward from the exterior of a supporting wall and held firm by the wall's upper continuation. They could then sustain the considerable weight of a stone floor, but resulting rooms were narrow. Romans continued the corbels across a series of interior arches to create wider rooms. Corbeling's efficiency is still visible in the remains of two- and three-story houses, some with staircases almost intact after 1,500 years and several earthquakes. In the early 1970s, the site was surveyed by Dutch-born Canadian archaeologist Bert De Vries of Calvin College, in Michigan, and has been partially excavated in the years since. Builders and inhabitants of Umm el-Jimal were mostly Arabs, perhaps some Nabataeans, but the stamp of Rome lies clear on the vast black ruins. "Inhabitants of a Roman city didn't all have to come from Italy," De Vries points out dryly. Under Roman

guidance, they could build, as they did here, enormous reservoirs and water systems, roads, a fortress and a praetorium, or headquarters, for the local commander.

Most of the national schools of archaeology now headquartered in Amman began life as Jerusalem-based institutions. The American Schools of Oriental Research (ASOR) was founded in 1900 and soon established centers in Jerusalem and Baghdad. (It now counts 172 institutional members in North America and abroad.) After a series of Arab-Israeli conflicts, ACOR was established in 1968 in Amman as the counterpart to Jerusalem's W. F. Albright Institute of Archaeological Research (AIAR).

In mid-1986, ACOR, under the direction of Dr. David McCreery, opened spacious new quarters on one of the hills of Amman overlooking the University of Jordan and near both German and British archaeological centers. From there it will continue to aid not only American scholars and archaeologists but those from nations with no local headquarters of their own —Belgians, Canadians, Australians.

Thanks to the work of all these teams and the efforts of Jordanians themselves, the old Roman cities have become popular tourist centers. An inscription found in Jerash some years ago announced an annual contest, to be held in the great South Theater, for the "Sacred Guild of the ecumenical, victorious, crowned artists in the service of Dionysus and of our Master." Obviously designed to stimulate both the arts and their patrons, the contest was regarded by Gerasenes as a worthy cause for such an important and enlightened city.

Thus it is highly fitting that Jerash today is home not only to a sound-and-light show in the ruins but also to an annual three-week festival of art and entertainment. Each August it swarms with local and international dance troupes, musicians and folklife expositions.

"The sight of thousands of Jordanian and foreign tourists strolling happily through the ruins of Jerash on a summer night is a very satisfying thing," says an American-educated Jordanian. "It puts us and this ancient city into the real world, and I think that is a very healthy use of one's antiquities."

Astarte, patroness of Gadara, has lost her head but still occupies the place of honor in the West Theater.

Seats for dignitaries were made of carefully worked black basalt; ordinary spectators sat in the bleachers.

Mowing—N.C. Wyeth

Liberty Launch—Andrew Wyeth

And Then Into The Deep Gorge—James Wyeth

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Milan, Italy—Palazzo Reale. May 17—June 20, 1988
Cambridge, England—The Fitzwilliam Museum. July 12—Aug. 29, 1988
Chadds Ford, Pennsylvania—Brandywine River Museum. Sept. 17—Nov. 20, 1988

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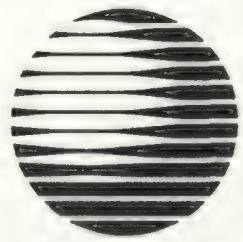

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Miniaturized in photomontage, multiple images of biologist Jonathan King appear on a field of bacterial virus he studies. He animatedly explains how, after it takes over a cell's genetic machinery, the virus then assembles replicas of itself, step by step, with the materials obtained from or manufactured by the cell.

By Fred Hapgood

Viruses emerge as a new key for unlocking life's mysteries

The simplest forms of life, and the bearers of myriad ills, these infectious particles are also teaching scientists how cells work

To almost everyone, viruses are bracketed with bacteria as another sort of "germ," all examples of which fall between disagreeable and dangerous. Even many biologists share this opinion ("A virus is a piece of bad news wrapped in protein," said Sir Peter Medawar, Nobel laureate in medicine) and it is easy to see why. Viruses contribute to giving us AIDS, chicken pox, colds, cold sores, viral encephalitides, hepatitis, herpes, influenza, measles, viral meningitis, mononucleosis, mumps, polio, rabies, shingles, smallpox, yellow fever, viral pneumonia and a host of other disorders. They are implicated in some cancers and leukemias, and in many autoimmune diseases, including multiple sclerosis, rheumatoid arthritis and diabetes. They prey not only on us but on every other organism in the biosphere, including plants and even bacteria, and are a constant menace to our livestock and agriculture. They give us warts.

Since the discovery of antibiotics, which keep bacteria on a short leash, viruses have become the only other organisms on the planet, besides ourselves, that pose a serious threat to our survival. If the means were to appear to wipe out every virus on Earth, most of us, including many who give lavishly to the World Wildlife Fund, would be happy to push the button.

The only voices raised in defense would likely be those of scientists in molecular biology and the associated disciplines like cell biology and molecular genetics. To those researchers, viruses are one of the ornaments of the planet, a resource that has already benefited our civilization handsomely and that will certainly pay much larger dividends in the near future. Some in these professions even suspect that we might be all wrong about their role in the biosphere, that they are essential to evolution. At the extreme, there is the possibility that viruses are part of a great message-carrying service that allows all the cells on the planet to engage in an extended discussion about their trade, about how to be the best possible kind of cell.

But, imagining how the debate would go, one guesses that the scientists might fail to carry their point. The pain that viruses cause is all too conspicuous, and their special genius is too easy to undervalue. For what they have, what makes viruses as unique a life-form as we have on the planet—certainly what makes them so important to us, and potentially to every other living thing—is their simplicity. And, outside of those sciences and maybe monasteries, simplicity is not an easy virtue to appreciate. "So they're simple. So what?" a person might ask. And the answer to that question is not simple at all.

The first to suspect that viruses were different— radically different—from any other form of life was a Dutch botanist and microbiologist named Martinus Beijerinck, who studied the organisms at the turn of the century. Beijerinck and his contemporaries knew that if cells from an organism with certain diseases were mashed up and the fluid extract were passed through the finest filters that could be made, the resulting filtered extract would still be infectious; it could still pass on the disease when injected into a healthy organism. This finding had been taken, logically enough, to mean only that toxins were the culprits; or that there must be bacteria or spores far smaller than any yet discovered. Beijerinck devised a series of experiments that showed that these infectious extracts in fact behaved nothing like bacteria. Wrestling with the evidence, he proposed the existence of a noncellular form of life, "a soluble infectious germ," that reproduced by diffusing right through the walls of a cell into the protoplasm itself, thus being passively included in the cell's own reproduction process.

The idea of a life-form without body walls was too

Produced and photographed by Yoav Levy and Peter Angelo Simon

extraordinary to be accepted, but the Dutch scientist's research convinced many that this corner of the biota was worth looking into. By 1931 William Elford of the National Institute for Medical Research in London developed a new filter technology that added to the ongoing argument that, contrary to Beijerinck's speculation, viruses are discrete entities, particles, though amazingly small. (A virus can be to an animal cell as a basketball is to New York's World Trade Center. "If a virus could see what it was doing," one researcher joked, "it would be overwhelmed.") But as remarkable as the theory was, it paled before the accomplishment of Wendell Stanley of the Rockefeller Institute for Medical Research, who, four years later, actually crystallized viral "particles."

Like appliances off an assembly line

Stanley's experiment was, as the historian Horace Freeland Judson has written, "the most portentous and publicized discovery of the decade." For a preparation to crystallize, its constituents have to be perfectly identical, with exactly the same shape, weight and chemical characteristics. Further, each such constituent in a crystal is separated from its neighbors by exactly the same distance. Nothing less biological, more dead, could be imagined. Living things are perpetually in flux and endlessly various. To the layman, that there were organisms that could crystallize, emerge into a robustly infectious stage and then recrystallize suggested there were creatures that crossed routinely between life and nonlife, from being an organism to being a chemical—and back again. This startling idea sank deep in the culture, and to this day most lay discussions about viruses allude to the problem of whether they can properly be said to be alive.

To the professional scientist, Stanley's results had a slightly different meaning, though just as exciting. For more than a century scientists had been tantalized by the prospect of answering the biggest questions one can ask about the nature of life—where it comes from, how it proceeds, where it goes—on a physical level by describing what goes on within a living organism in terms of its fundamental parts. This had always seemed impossible: biological entities appeared to have too much variety, complexity and unpredictability. Science prefers to work with standardized materials, and until Stanley, life was thought the enemy of standardization. The crystallization experiments proved the contrary: that there are creatures that don't change, that don't grow, that come in standard models, like appliances off an assembly line. They suggested that there existed an experimental vehicle that, if scientists could only figure out how to mount it, might carry them deep into the nature of life.

In the years just after World War II a group of extremely ambitious and skilled scientists in Europe and North America began to correspond with one another about this opportunity. They referred to themselves as the "phage group" or, sometimes, the "phage church," after the name of the type of bacterial virus they agreed to work with.

The first problem the members of this church tackled was the mystery of the gene. "If it be true that the essence of life is the accumulation of experience through the generations," a charter member, an ex-physicist named Max Delbrück, wrote, "then . . . the key problem of biology, from the physicist's point of view, is how living matter manages to record and perpetuate its experiences." Put more specifically: Where is this information carried? More specifically still: In what molecules?

Analyses of a phage showed that it is composed of a few dozen proteins and trace amounts of an obscure acid associated with cell nuclei. That a living thing could be composed of so few molecules was itself a wonderfully helpful simplification—most animal cells have thousands of different types of proteins alone and several different classes of nucleic acid—but still a choice had to be made. The consensus at the time was that the gene molecule was probably one of the proteins, or perhaps some complex of proteins, because, in general, proteins seem to be responsible for most of what a cell does. Besides, nucleic acids were thought to have been shown to be dull, repetitive molecules incapable of any sophistication.

A little like aphids on a leaf

For several years the identity of the gene molecule eluded the profession. Then, in 1952, Alfred Hershey and Martha Chase of the Cold Spring Harbor Laboratory of Quantitative Biology conducted one of the most inspired and lucky experiments in postwar microbiology. The two scientists had seen pictures, taken with an extraordinary new instrument called the electron microscope, of phage particles infecting a bacterial cell. These photographs showed the particles lined up on the outer surface of the cell, looking a little like aphids sucking juices from a leaf. On a hunch, the scientists placed a solution of phage-infected bacteria in a blender and ran it just long enough to knock the viruses off the cell walls, but not so long as to kill the bacteria. Clever labeling with radioactive atoms showed that almost all the proteins, and predominantly only the proteins, had got knocked off; the nucleic acids of the viruses were still associated with the bacteria. The clincher was that the infections then proceeded normally.

This experiment established that it is the nucleic

Cytologist Anne de Bruyn Kops appears surrounded by glowing red proteins in a cell as it's seen through her microscope. To simplify study of protein transport within cells, she infects them with a virus that allows the manufacture of only a few specific proteins, rather than the thousands produced by a normal cell.

acid, DNA, that transmits the genetic information, and not the protein, as had previously been assumed. It suggested, in fact, that once a virus is attached to the cell surface, its proteins play no further role in any other stage of the infection. From that point the virus is nothing but the unadorned, individual DNA molecule. (This has turned out to be so for most viruses, although there are exceptions.) One of the first to receive a letter from Hershey describing his experiment was a young member of the phage group named James D. Watson, then working at Cambridge University, who saw its importance immediately. One year later, in perhaps the most important scientific discovery since Einstein's theories, he and Francis H. C. Crick, also of Cambridge, announced that they had elucidated the atomic structure of DNA. From a clue that came from studying the phage virus, the mystery of the gene had been solved.

A quirky, unpredictable relationship

Since then, the close connection between viruses and genes has remained a constant theme, although the stories of the relation between viruses and their hosts have proved as quirky and unpredictable as any tales that biologists have to tell. Consider an animal cell over which is running a river of cellular fluid, perhaps lymph or plasma. A virus particle appears in the flux and is carried over the cell surface. Both the cell surface and the virus particle are thick with spikes that reach out into the streaming fluid. When the spikes of a virus and an animal cell touch, they bond, and the virus is drawn down onto the surface of the cell like a piece of flotsam snagged with a boathook. Some viruses, when they reach the cell membrane, pass directly through the cell wall like a ghost; others are engulfed, eaten, enfolded by the wall as though they were a delicacy of some kind.

Once inside the cell the number of ways a virus can go about its business explodes. Building complex parts in a cell, including complete copies of viruses, is in some ways just like building a machine on a factory floor: it requires tools—the biochemical equivalent of ripsaws, drills, soldering irons, screwdrivers, rolls of tape and the like. For example, MIT molecular biologist Jonathan King (p. 116) and his colleagues were the first to determine that the "tail" of one type of phage is assembled inside a cell. First a "scaffold" protein is made. Then, building-block proteins are added one at a time until a "measuring tape" protein determines that the length is right. With the structure complete, the scaffold protein detaches, to be used again. Some viruses, like the herpes virus, come in with a hardware store of their own; others, such as the tobacco mosaic virus, make use of the cell's tools almost exclusively. Nobody knows why this difference exists or what it means.

Some viruses, when they enter a cell, are not infective—they have only one strand of nucleic acid and require two. Yet, for reasons that are still a mystery, the host cell immediately and obligingly repairs the virus allowing the infection to begin. And finally, in what is certainly the ultimate in hospitality, there are hosts that integrate viral genes right into their own DNA so that thereafter, whenever the host cell replicates, a copy of the virus is made too. This type of virus is known as a retrovirus, and its life cycle is illustrated in the sequence of photographs on pages 121-23. AIDS can result from one member of this family. The gene responsible for feline leukemia is thought to have entered the cat gene line millions of years ago as an infection by one of these retroviruses.

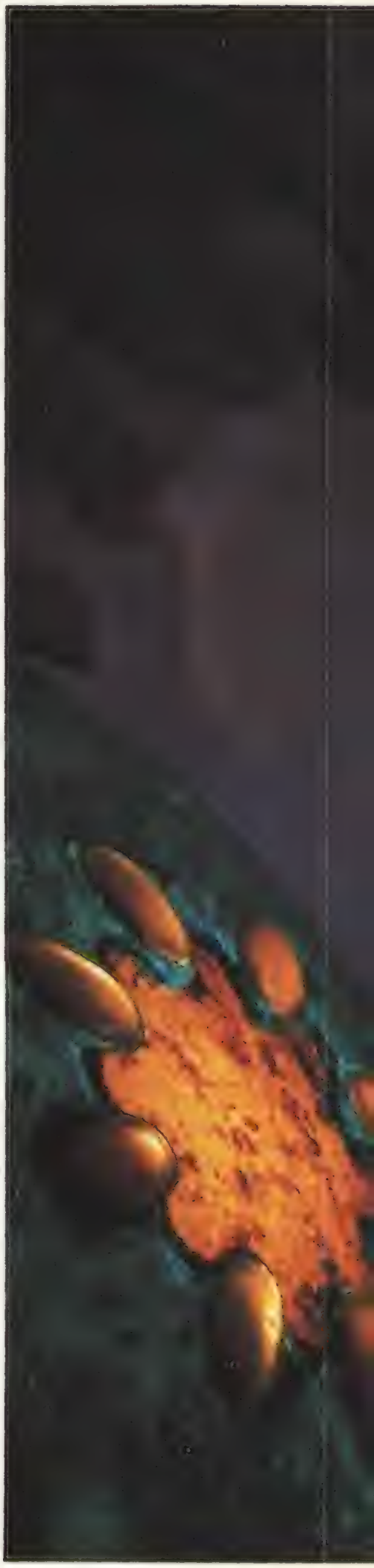
"Without viruses," says David Knipe of Harvard University Medical School, "contemporary molecular biology would be unimaginable." A normal animal cell makes thousands of proteins; some infected cells make fewer than six—the viral proteins. As distressing as this might be to the cell in question, from the perspective of someone trying to understand how cells make proteins, viruses impose a wonderful simplification on a terrifically confusing landscape. Further, it is hard to do experiments on a gene without having pure samples of the material; that is, without concentrations composed of millions of copies of a single, identical gene. Had there not been an organism like the virus around, many strains of which have less than a half-dozen genes, scientists would have had to try to get these pure extracts out of creatures with thousands of genes. This might not have been impossible, but it surely would have been hard. And, of course, all viruses of a strain are perfectly identical, an invaluable property for an experimental tool.

The services rendered by viruses continue to this day. On a recent visit to Knipe's laboratory I was introduced to Anne de Bruyn Kops (p. 119), a graduate student in cell biology. She is concerned with the problem of protein transport—the complex traffic of protein molecules moving about a cell with apparent, but as yet inexplicable, order. "My particular interest," she said, "is in how the proteins used by the cell get from where they are assembled to where they are needed. One idea was that proteins just circulated randomly around the cell until they happened to bump into the

Boston free-lancer Fred Hapgood last wrote for SMITHSONIAN *on directory assistance (November 1986). Photographers Peter Simon, Yoav Levy were aided in virus life-cycle sequence by biologists Steve Goff, Scott Emmons and Jack Lenz, model makers Tom Klem and Cass Henselmann, and set designer Ian Christie.*

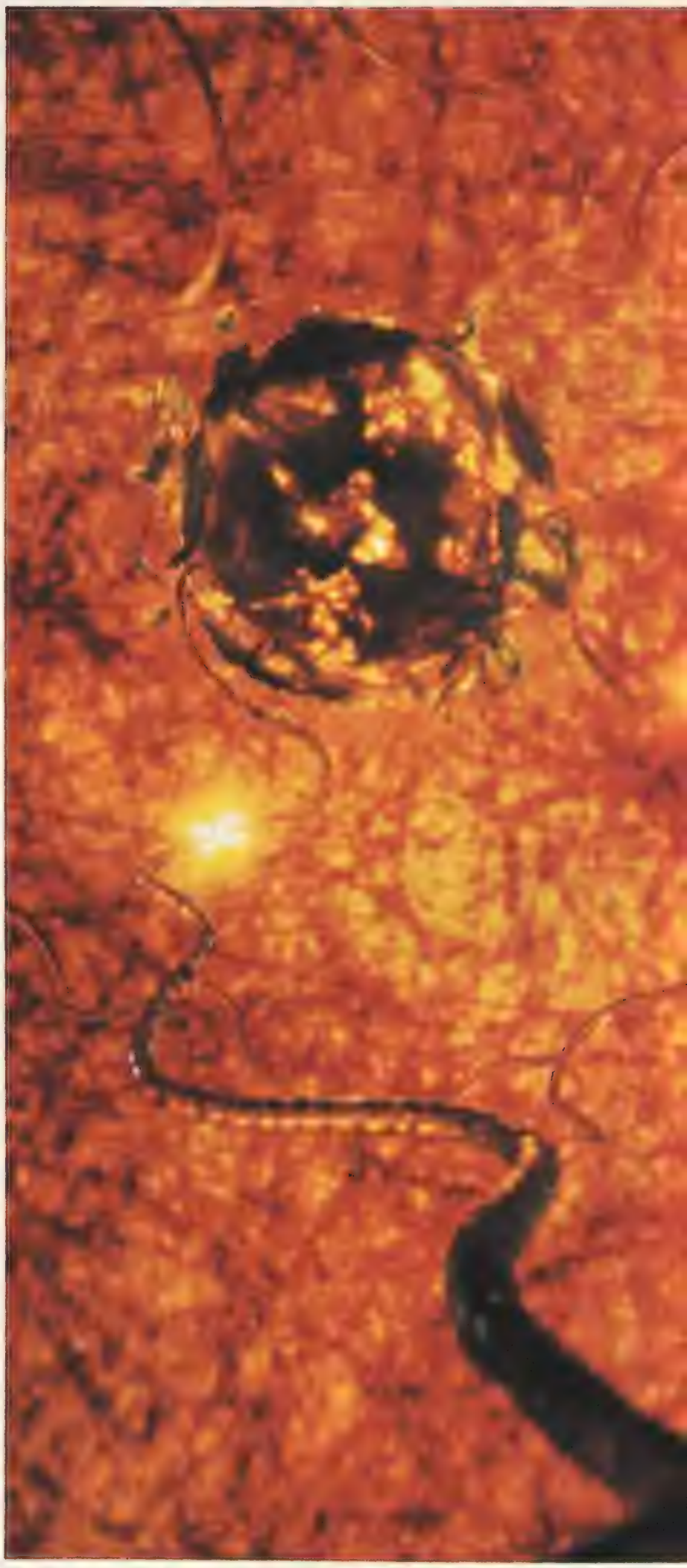
Fold out →

How one virus tricks a cell into making more viruses

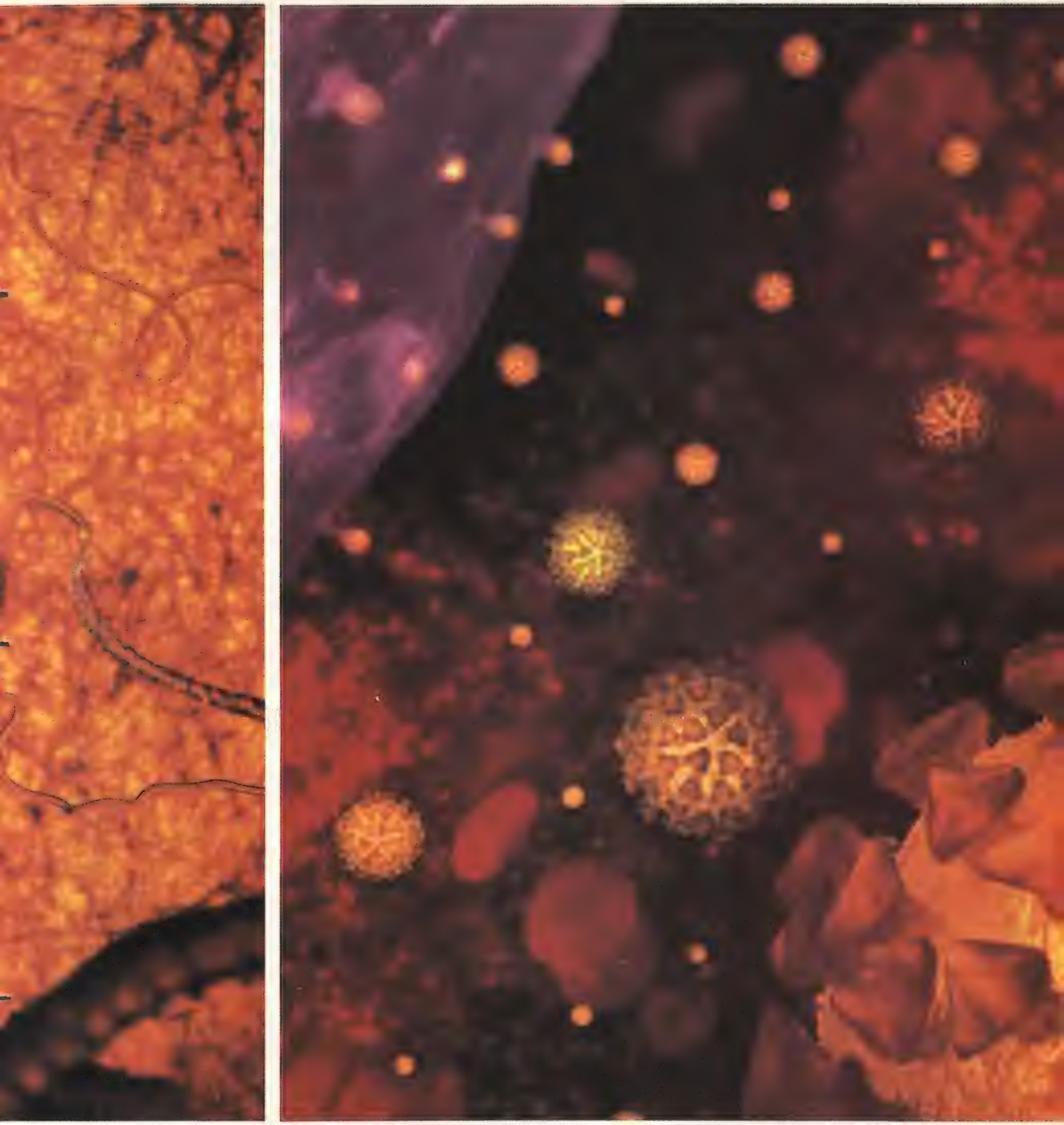


The photographs on these pages, using models based on recent research discoveries, show how one type of virus (called retrovirus) infiltrates a cell and turns it into a factory for making more viruses. Above, virus moves across protein-studded landscape of white blood cell's surface, contacting a spiky receptor to which one of its own knobby proteins sticks. This chemically unlocks the cell, which may do little to defend itself.

After the virus' outer coat fuses with the cell, inner container of virus, a protein core, is released into the maze of granules and protein structures inside cell. Here, the disintegrating core moves toward one of the pore holes in the nucleus (lower left). Before entering nucleus, the core lets in enzymes from the cell, which act to convert the viral nucleic acid (in a form called RNA) into DNA, like that of the cell's own genes.



Having moved into the nucleus, virus core releases its tangle of DNA, which is spliced into the cell's DNA (at the flashpoints in photograph). As the cell follows directions from its own genes in making proteins, it also follows those of the viral genes, making proteins for new cores and packing them with new viral RNA. Cores then migrate to cell surface—where virus coats are produced to surround cores.



Completely assembled, new viruses on cell's surface (upper left) bud off into bloodstream, free to find and attack other host cells. Greenish-hued virus at center represents a mutant, which may produce a new strain of virus, as sometimes occurs. Entire life cycle, from entry to budding off, takes a few days. However, a retrovirus may splice its DNA into a cell's and remain dormant—even for years—before replicating.

In his lab, microbiologist Michael Syvanen studies bacterial colonies that arise from viral transfer of genes. Virus can convey antibiotic resistance from one species to another. He thinks viruses may have a similar role in carrying genes between plant species, one way different species may acquire common traits.

right site. But we now know there are too many proteins, and they arrive where they are needed too quickly, for this to be the only possibility. But so far we have no good idea of how it is done."

Ideally, de Bruyn Kops would like to slip into a working cell and follow a protein around. This being impractical, she was considering using a stand-in of more appropriate dimensions: the herpes simplex 1 virus. When I met her she had just prepared a set of slides to help her decide precisely how useful such an assistant might be—to see how accurately it moved about in the cell—and was about to examine them. Specifically, she was looking for evidence of whether virus proteins made in a cell would travel to the cell's gene-copying centers. To find out, she had stained her slides with dyes that would show the genes in red and the proteins in green when illuminated with different wavelengths of light.

De Bruyn Kops opened a door on a long, narrow room at the end of which, half in shadow, rose a spectacular binocular microscope. She crossed over to the instrument, made by Zeiss of West Germany, sat down and began to flip switches. "Be sure not to look in here," she said, pointing to a series of bars behind which, like a wild animal in a zoo, lived the ultraviolet generator. She opened her slide book. There, laid flat, were just three slides, each smaller than the tape from a postage meter. De Bruyn Kops lifted the first out, added a drop of oil, slid it into the machine and lowered the body of the instrument until it barely touched the slide cover. She moved very carefully, very deliberately. By then those three slides represented not only 12 hours of the most delicate and exacting labor, but a test of a technique that might influence her research for months. The room illumination shifted to photolab red, the generator went on inside its cage and the cells on the slide began to fluoresce.

Out of Africa, into the lab

A first glance through the mighty Zeiss revealed what looked like luminous rose veils thrown carelessly over one another, through which were strung dozens of untwinkling bright dots of ruby light. The veils of light were cells that had once belonged, many dozens of cell-generations ago, to the skin of a kidney from an African green monkey ("Only because those cells happen to lie nice and flat," de Bruyn Kops explained). The ruby dots represented the copies that each cell had made of its genes just before being killed for this experiment. Talk about hard luck: the ancestors of these cells had been snatched out of their normal environment, Africa, taken to some research institute and selected to grow for laboratory conditions. Their progeny were then sold to the Harvard Medical School, where they had fallen into the hands of de Bruyn Kops, who had infected them with herpes. Yet, as the ruby dots proved, they had still struggled on, striving to the end to replicate. Soon one lost the sense of looking down and seemed instead to be gazing upward, through crimson nebulae, blown and blooming in a moonless sky salted with fire-red stars. "I could look at these for hours," the biologist murmured.

She pressed a light switch and the fluorescence shifted from red to green as a new wavelength illuminated the dye for proteins. Now, amid glowing green veils there were bright dots of emerald. The nebulae were still clearly the monkey cells, but the stars now represented proteins made by the viral genes. De Bruyn Kops moved the switch back and forth, from green to red to green. "What do you see?" she asked. There could be no question: the ruby and emerald stars mapped over each other almost perfectly. Somehow the virus had managed to discover the address of almost all the places in the nucleus that copied genes and had sent its proteins to precisely those sites. Or, to put it the other way, somehow the cell had picked out the viral proteins and transported them to its gene-copying factories. In either case, bingo! De Bruyn Kops now had a narrowly defined, simple system in which to explore the mysteries of protein transport.

At the threshold of new knowledge

In large measure, the science of viruses stands at the same threshold as de Bruyn Kops—the knowledge at hand allows us to explore the big questions but does not answer them. There is not, as yet, even an agreement about the precise relation of viruses and genes. Traditionally and naturally, viruses have been seen as alien invaders; as competing against us for the manufacturing facilities in our cells. The theories of their origin have reflected this feeling of otherness and distance. Perhaps the most common concept has been that viruses began as bacteria and over time, through natural selection, gained such skill in the manipulation of their hosts that they were able to strip themselves down to the minimum for reproduction, the genes themselves. Another theory points out that there must have been a time early in the origin of life, when living things, or what were to become living things, were nothing but large interacting molecules. Perhaps viruses have survived essentially unchanged from that period, or at least far less changed than we.

Both of these theories, and others addressing the same question, have stressed how *different* viruses are. Thus one of the more unexpected discoveries made by cell biologists has been the number of perfectly normal features of the cell that resemble, sometimes very closely, viral structures and behavior. Free-floating

strings and circles of nucleic acid have been found that look and behave much like the strings and circles that viruses introduce into cells. Retroviruses actually splice viral DNA right into the chromosomes of the host; genes called transposons cut themselves out of one location on a chromosome, float around the nucleus for a while, then splice themselves back into the gene set at a second address. Discovery of these and other similarities between parts of a normal cell and viruses has led many scientists to speculate that viruses might have arisen as parts of our own cells that broke free and went out into the world.

No matter how they arose, hints are beginning to appear that the relation between viruses and our genes has far more to it than the simple matter of genetic conquest. Viruses not only carry their own genes from cell to cell but those of other creatures as well. "Sometimes," says Michael Syvanen, a molecular biologist at Harvard Medical School, "a piece of the genes of the host gets trapped or caught inside a viral shell, replacing the viral genes [p. 124]. These shells are then released. If one is taken up by a new host, the genes are set free in the cells of that host. Since there are no viral genes in the shell, those cells are not infected, and sometimes the new gene is incorporated into the genes of the second host. Bacterial resistance to antibiotics is accomplished by bacteria of different species exchanging genetic information. But lab experiments have also shown that this exchange could, in principle, be mediated by phages. Animal viruses have been found in which some of their genes have been replaced with animal genes, presumably those of a previous host."

Syvanen suspects that this phenomenon plays an important role in evolution, though he emphasizes that this has not yet been proved. Nor is he alone: Sorin Sonea (opposite) and Maurice Panisset, microbiologists at the University of Montreal, have written a book arguing that all bacteria are interconnected by viruslike organisms into a single, planetwide gene pool. "Thus the bacterial world functions as a vast communications network to promote life in all possible niches of the planet by establishing associations of different types and genetic permutations whenever conditions are favorable," they write. Lynn Margulis, a bacteriologist at Boston University, has hailed the book as "a manifesto for a new bacteriology."

Whether or not viral infections serve the interests of the host cell in nature, there are a number of research teams hoping that they can be made to do so as a medical treatment. Many diseases—Alzheimer's, Huntington's chorea, perhaps manic-depressive illness—are caused at least in part by gene defects and genetic damage. An ideal therapy would be to load up millions of virus shells with healthy genes and then infect the relevant tissues—brain or liver or skin—so that the cell would incorporate the new genes into its own DNA.

Richard Mulligan's lab at the Whitehead Institute at MIT, one of these viral-research centers, is working with beta thalassemia, a genetic disease that affects the production of hemoglobin in children. In his lab, such virus-mediated gene repair has been done with mice but not yet with humans. "What people are doing now are long, exhaustive sequences of experiments trying to figure out exactly what to put in the viral shell," he says. "When we have that resolved there may be other problems, but most of us feel that in 10 to 20 years this type of therapy is going to have a big effect on the practice of medicine."

"If viruses were nothing but bad news . . ."

One reason for thinking there may be undiscovered chapters to the virus story is the very theme that has run through our short history with the creatures: their simplicity. There is so little to a virus, and so much sophistication in a cell, that it seems somewhat strange that cells don't do more to prevent these genetic takeovers, especially since viruses rely on their hosts for so much. "If viruses were nothing but bad news," says Syvanen, "you would expect cells to be taking great pains to evolve resistance to them. And they do express resistance in some ways, but they also seem awfully accommodating in others." For example, viruses self-assemble inside the host. An evolutionary biologist would surely predict that cells ought to be selected to interfere with that synthesis, thus inhibiting the spread of infection through the system. Yet somehow evolution has not taken that turn.

"We are now with respect to viruses where the 19th-century bacteriologists were with respect to bacteria," summarizes Hyman Hartman, a microbiologist at the University of California, Berkeley. (Hartman has writ-

ten a paper arguing that viruses are important in the origin of species—that they can alter the genes of an infected population such that its members can mate only with one another and not with other members of that species. This would split up a species into separate mating pools, one way that new species are born.) "At that time the only bacteria known were those that caused diseases," he goes on."All the symbiotic associations that living things have with bacteria, including the degree to which bacteria drive the great geochemical cycles of the planet, were unknown. Today, the viruses really known to us are those that cause problems. But that's because that's the only way we have, so far, of finding them. Perhaps our vulnerability to pathogenic viruses is just the price that must be paid if we are to continue to accept other, less visible, benefits. In any case, I'm sure that so far all we have seen is the tip of a large and very interesting iceberg."

According to a theory proposed by microbiologist Sorin Sonea and colleagues, viruses play role in exchanging bits of genetic information (yellow dots), interconnecting all bacteria (red and yellow shapes) into planetwide gene pool, and thus may have a key part in maintaining balance of global ecosystems.

MT 138

By Jon Krakauer

Truckers brave the barren lands to supply an Arctic gold mine

In the depths of winter, the rigs roll north from Yellowknife across 340 miles of frozen lakes—while the drivers hope for the best

There's something about gold—something about its permanence, its scarcity, its heft and luster—that makes people take leave of their senses. Gold fever may well be the oldest mental infirmity to afflict humankind; since the beginning of recorded history the merest rumors of the yellow metal's existence have prompted otherwise clearheaded men to abandon their loved ones, endure unspeakable hardships and journey to the least hospitable ends of the Earth.

This is no less true today than it was in the days of the Klondike gold rush or the Spanish conquistadores. Consider, for example, the case of a beefy young Canadian, Christian name of Elvin, who is making his way to a modern-day mother lode called the Lupin gold mine, 2,100 feet under the permafrost, 65 miles below the Arctic Circle in the empty center of Canada's Northwest Territories, a region in which the caribou population outnumbers the human population by a ratio of 25 to 1. It is late February 1987, and Elvin is behind the steering wheel of an 18-wheel tractor-trailer rig, hauling a load of shot-put-size steel balls to be used in the ore-crushing process at the mine.

On the one hand, as I see Elvin sitting in shirtsleeves in the heated cab of his rig, sipping hot coffee from a thermos while the soothing twang of some country singer emanates from a tape deck, he hardly seems to be in the same boat as, say, the followers of Lope (Wrath of God) de Aguirre who, while searching for El Dorado in 1560, met various unsavory ends in the Amazon jungle. On the other hand, just beyond Elvin's windshield is a frozen landscape so desolate and featureless and unrelentingly white that the appearance of so much as a rock would be a major relief. A 20-knot breeze is rapidly covering the roadway with snowdrifts and stirring up a ground blizzard that makes it impossible to distinguish between earth and sky. The air temperature out there is 0 degrees F, which equates to –40 F when you factor in the additional bite of the wind chill.

The temperature, in particular, is on Elvin's mind this morning. "It's been this bad all winter," he carps. "Way too warm." To understand how a man could feel that zero is overly balmy, it is first necessary to understand that the road over which Elvin's truck is rolling is not really a road in any traditional sense, but rather nothing more than a plowed lane down the middle of a 70-mile-long frozen lake.

All told, Elvin, his rig and his load of steel weigh approximately 50 tons, and the only thing preventing them from sinking like a giant stone into the frigid, 200-foot-deep water directly beneath the truck's wheels is a skin of ice, about four feet thick, that has formed across the surface of the lake. For the ice to thicken sufficiently to support a loaded semi, the weather has to be extremely cold. When the temperature climbs to a relatively tropical zero (27 degrees F above the seasonal mean) and stays there for several weeks, Elvin and the 80-odd other truckers who spend their winters hauling freight to the mine get nervous.

Their nervousness is heightened by the fact that it is not just a single lake the truckers must traverse to get from Yellowknife—the community of 11,750 that is the Northwest Territories' capital, commercial hub and closest approximation of a city—to Lupin. After 40 miles of territorial road, all but 30 miles of the 370-mile route the mine has constructed is over water. To facilitate a quick exit if one should be required, truckers are forbidden to wear seat belts; a number of

A fuel oil tanker rumbles over the ice of a lake in the Northwest Territories; more follow at a distance.

Photographs by James Balog

Daniel Wiener

Heavily braced structure houses pulleys and cables that lift both miners and ore out of 2,000-foot shaft.

Frank Morin pours a hot liquid that is 85 percent gold; three tons of ore yield only about one ounce.

drivers, in fact, admit to negotiating long sections of the "winter road"—as they laconically refer to this nasty highway of ice—with one hand always on the door handle.

From up in the cab of the truck, the snow-covered surface of the lake presents the reassuring illusion of being as solid as concrete, but a walk along the roadway gives a very different impression. At close range, the ice is unexpectedly pretty, polished to a high gloss and shaded from a palette of ethereal translucent tones that range from pearl to onyx to a luminous robin's-egg blue. But the ice is also riven with cracks, some several inches wide and running for hundreds of yards. Whenever trucks roar past, they depress the ice a few inches, sending waves out beneath the lake surface, causing the roadway to heave like a huge waterbed, accompanied by an alarming chorus of sharp pops and tortured groans.

When the world falls out from under you

Truckers might be reassured by the fact that no vehicle has gone all the way to the bottom in deep water; not a single driver has been killed on the winter road. But two tractors, a trailer and a plow have broken through, underscoring the ever-present potential for catastrophe; so the truckers stay jumpy. Much of their anxiety comes from the utter lack of predictability about where or when the ice will give way. In March 1986, for instance, 17 trucks of more or less equal tonnage were bound for the gold mine, traveling about a quarter-mile apart. One might logically expect the first or second truck in such a convoy to be at the greatest risk, yet while crossing a big body of water called Mackay Lake, it was the 15th vehicle in the line that suddenly broke through and went down in shallow water after the first 14 had passed over the same spot without the slightest hint that anything was amiss. (Convoys are rare but trucks always travel in pairs or threes in case something happens to one; a driver who has to leap for his life is not left stranded.)

The prospect of riding a 50-ton truck to a cold, watery grave is the most vivid of the perils of driving the winter road, but it is by no means the only one. Severe blizzards can come up with little warning, burying the road under four-foot drifts, stranding a trucker on the middle of a lake (which is why every trucker is required to carry at least two days' food and water, and enough diesel fuel to keep an engine idling for a week). Additionally, a very heavy snowfall can weight the frozen lake surface enough to sink the whole thing slightly, forcing water up through fissures in the ice and flooding the roadway. A truck's drive wheels can start to spin uselessly when there is as little as three inches of water on top of the ice.

The moon rises over the Lupin mine, a small village in the middle of nowhere with library and hockey rink.

The mine with its offices and living and sleeping quarters is surrounded by piles of ore and supplies.

Even the caribou, which number in the thousands along the winter road, create hazards for truckers. The live animals aren't the problem; it's the ones that have fallen prey to hunters. When an animal is shot, it is generally hauled to the plowed roadway to be skinned and stripped of meat, after which the remains are often simply left in the track. Along the southern part of the route—where both hunters and caribou are the thickest in the winter months—the road is dotted with these carcasses, and when a truck runs over a mound of frozen caribou intestines, the effect is little different from running over a boulder: blown-out tires and damaged springs.

The truckers who subject themselves to the aforementioned catalog of hazards, it should be pointed out, don't wind up with much more in the way of riches than the typical Klondike prospector did: their reward for each round trip between Yellowknife and Lupin—which takes three days if they don't break down or get stuck in a storm or go into a lake—is a check that amounts to about $400.

The truckers may not see much of it, but the bounty that lies at the end of the ice road is very real nevertheless. In the five short years that the Lupin mine has been in operation, it has yielded more than $190 million in gold. And geologists have determined that there are at least another one million ounces of gold still in the ground, and there could be anywhere from 100,000 to 10 million more.

The Lupin mine—the most northerly gold mine in the Western Hemisphere—is a complex of orange metal buildings huddled against the elements atop a barren, wind-blasted bluff. It is actually a small town, as self-contained as a space station, which shelters eating and sleeping quarters for more than 150 men and women; a diesel-fired 15 megawatt power plant; various wood, metal and machine shops; racquetball courts, a library, weight room, hockey rink and sauna; administrative offices; an ore mill and refinery; and, of course, the deep hole in the ground that is the little town's whole reason for being there.

The two- and three-story buildings are connected by

A contributing editor to Outside, *Seattle-based Jon Krakauer has written for* SMITHSONIAN *on the Alaskan herring fishery and the shaky claim of Mt. Everest.*

Truckers roll across the barren land

Guided by a helicopter, a plow makes the first pass over a lake as the road is opened for another season.

galvanized steel tunnels, obviating the need, for most of the mine's residents, to ever venture beyond the mine-complex walls. Indeed, in the mine offices, several workers incongruously go about their business in light summer shirts, or skirts and high heels, as if they had no idea they were in the Arctic, that a blizzard capable of freezing human flesh in a matter of seconds is rattling their windows.

Outside the mine buildings, stockpiled in towering mounds, are hundreds of tons of high-quality gold ore. Valuable though it is, nobody at the mine seems very worried that it will be pilfered, perhaps because nearly three tons of the stuff—which looks for all the world like ordinary black gravel—has to be processed to produce a single ounce of gold.

That milling and refining begins by repeatedly crushing the ore until it is as fine as beach sand, and mixing it with water and lime to turn it into a slurry. Cyanide is then added to this gray muck, which dissolves the gold and liberates it from the ore; when zinc is added to this gold-cyanide solution—a deadly, colorless broth—the gold precipitates out as a light-colored powder, which is gathered in filters, placed in a refractory furnace and fired up to 2,200 degrees F.

An hour later, the molten contents of the furnace are poured into a rectangular mold the size and shape of a small bread pan, and voila! You have before you a red-hot brick, weighing between 70 and 90 pounds, that is 85 percent gold, also contains some silver and is worth upward of $400,000. On average, the Lupin mine cooks up 18 or 19 of the gleaming little beauties every month.

The slice of earth that surrenders this munificence lies beneath a topographically unremarkable turtle-backed bluff that, to the untrained eye, is all but indistinguishable from the thousands of other turtle-backed bluffs that rise out of the lonely tundra around it from horizon to horizon. In the summer of 1961, however, something about the dark rock exposed on the crest of this particular bluff caught the eye of a student geologist working for a mining company formerly called International Nickel, now INCO Limited. The geologist was exploring for nickel deposits and had climbed the rise at Lupin only because it had looked like a good place to take a lunch break. As he was sitting down to enjoy his repast, though, he noticed some interesting mineralization in the dull gray rocks beneath his feet. He duly brought samples back to his employers; assays revealed the presence of gold, and INCO staked a claim.

Subsequent exploratory drilling showed that there was indeed gold at Lupin, perhaps lots of gold, but INCO was worried that the considerable cost of bringing the ore out of the ground and extracting the gold in such an inaccessible place would make it impossible for a mine at Lupin to turn a profit. There were certainly other mines located in remote corners of the Northwest Territories that had managed to make money for their owners, but without exception they were all situated either close to existing roads or near

The irregular line at left is a pressure ridge, along which winds and currents have piled the ice on itself.

Rene Tourigny (left) and Ben Kowalczyk use power auger to check ice thickness after plow broke through.

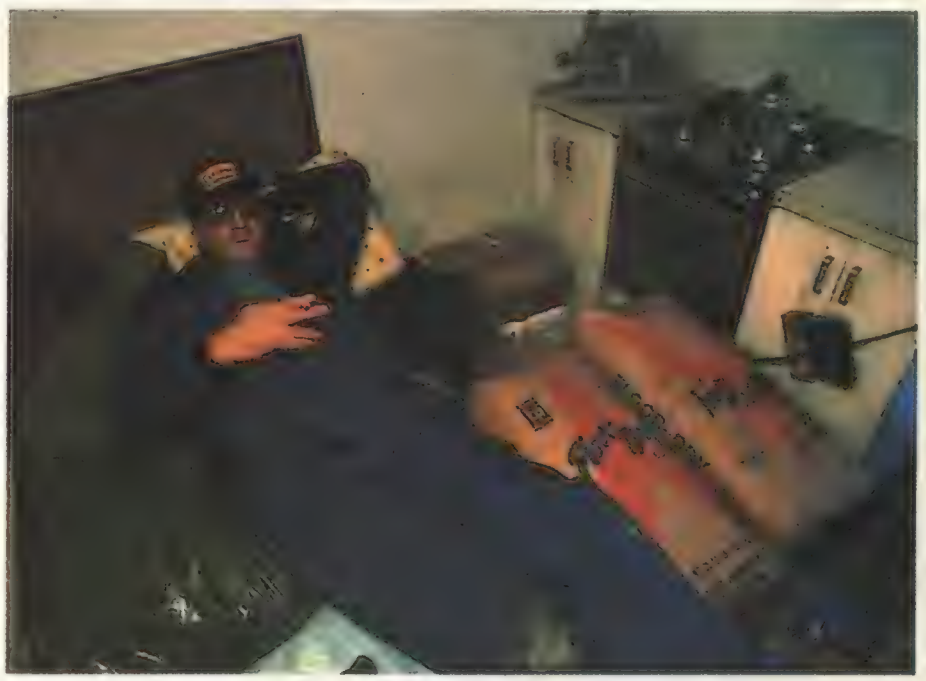
Ice-road foreman Phil Flaumitsch goes on foot to lead a plow across frozen lake where snow hides rocks.

navigable waterways that permitted the inexpensive delivery of heavy mining machinery and supplies by barge during the summer months. The only access to Lupin, in contrast, was by air. To build and operate a mine there, millions of pounds of equipment and materials would have to be flown to the site.

Enter John Zigarlick jr., a man not easily daunted. In 1979, Zigarlick—at the time the 41-year-old president of a small Canadian silver producer, Echo Bay Mines Ltd.—convinced his parent company to back an exploration program, then paid INCO about $3.8 million for the mineral rights at Lupin.

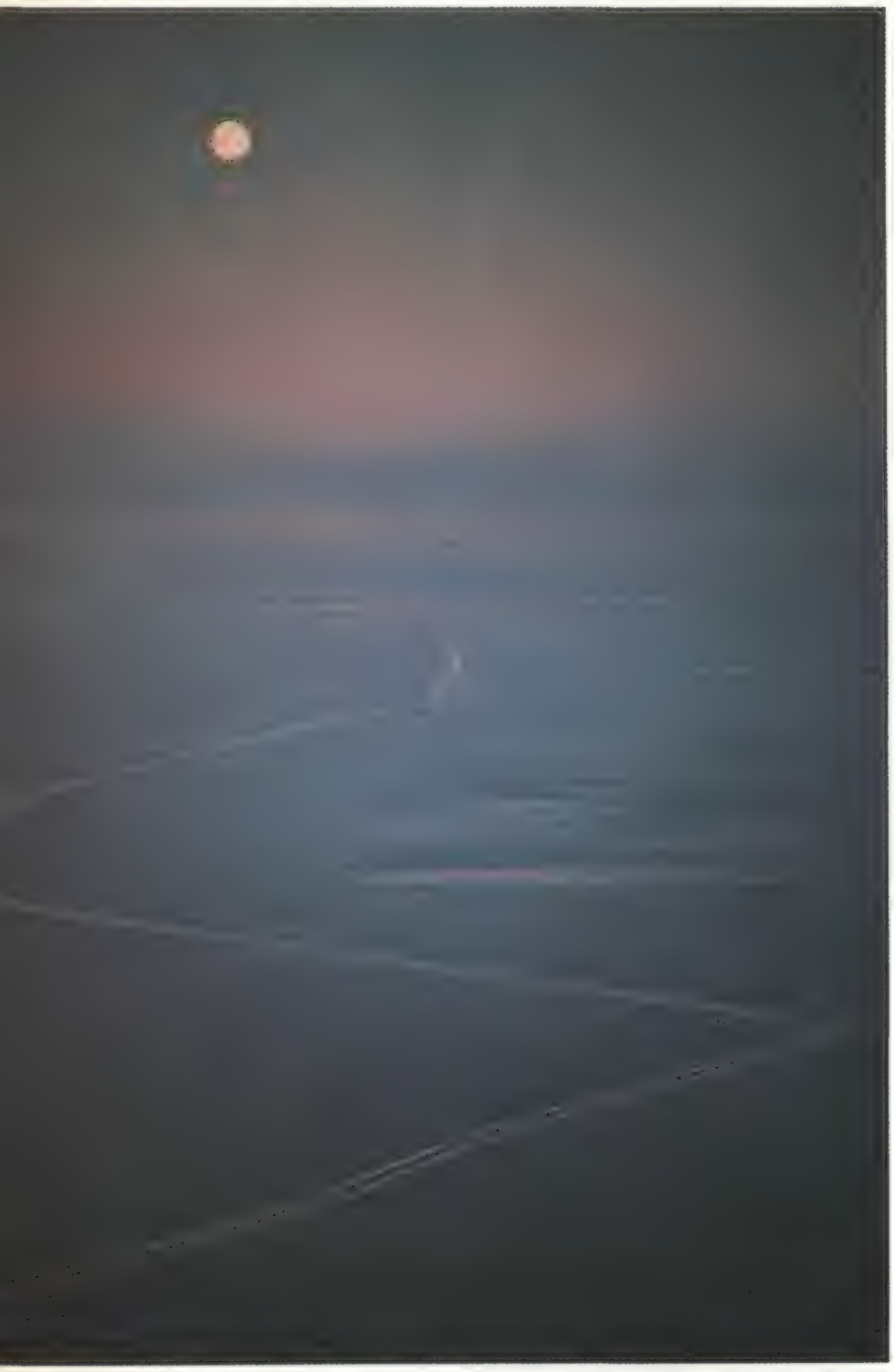
Zigarlick graded a gravel airstrip on the tundra, bought a C-130 Hercules aircraft and commenced flying in the arsenal of heavy machinery necessary to construct and operate a hard-rock mining operation a half-mile underground: earth movers, mammoth diesel generators, multiton hoisting equipment, rock drills, huge ore-crushing units—much of which had to be custom-built to fit inside the Hercules' cargo hold. Twenty months, 1,100 flights and $100 million later, the Lupin mine went into production.

When Echo Bay committed to purchase the rights



Dale Zwingli relaxes in his plow's sleeper cab, where he can survive nicely for a week if caught in a blizzard.

Truckers roll across the barren land



Under a cold moon the ice road zigs and zags across Mackay Lake in an almost perfectly empty landscape.

to the Lupin property from INCO, gold was trading at nearly $220 an ounce. A year later it had shot up to $800. Unfortunately, laments mine manager Bob Gilroy, "almost immediately after that, the price of gold started dropping like mad." When construction started at Lupin the price was down to $500 an ounce and by the time the mine finally opened that figure had nosedived to nearly $300. (As of late September, it had rebounded to $460.) Clearly, Zigarlick recognized, if the Lupin operation was to succeed in the face of low gold prices, it would be necessary to slash production costs to the absolute minimum.

In the course of bringing ore out of the ground and turning it into gold bars, the mine annually went through approximately 4.2 million gallons of diesel oil, 1.4 million pounds of explosives, 3 million pounds of steel rods and grinding balls, 1 million pounds of salt, 1 million pounds of lime, and half a million pounds of sodium cyanide. To cut the sky-high cost of flying this mountain of materials to the mine, Zigarlick resolved to find a way to bring the stuff in cheaply on the ground.

A conventional road was out of the question: the distance was too great and presented too many obstacles, not least of which were the thousands of lakes scattered across the countryside as densely as spots on an ocelot. Zigarlick concluded, however, that the same profusion of water that precluded overland travel in the summer months could, during the sledgehammer freeze of winter, be utilized as a natural highway—albeit a highway of ice.

Building a road for ordinary behemoths

In the winter of 1979, a convoy of trucks led by snowcats, bulldozers and graders had in fact managed to plow its way from Yellowknife to Lupin with a load of building materials. That road, however, was very expensive and had taken four weeks to open. During the next four weeks, 80 truckloads were delivered. To make a serious dent in the mine's operating expenses, the route would have to be made routinely passable for ordinary behemoths of the highway—run-of-the-mill Kenworths and Peterbilts and Whites—and stand up under the pounding of more than 800 truckloads of heavy freight each winter. Zigarlick laid this not inconsiderable challenge in the lap of a 39-year-old Arctic veteran named Phil Flaumitsch.

The winter road to Lupin was by no means the first of its kind—ice roads have been employed to get around in Arctic and sub-Arctic climes since the 1930s, and some 1,300 miles of them had been engineered in the Northwest Territories alone—but nobody had ever tried to build a winter road so far into the "Barrens"—the storm-swept wastes above the northern treeline.

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Flaumitsch talks on radio to the helicopter pilot who is guiding plows on stretch with no landmarks.

"That first year it was tough," Flaumitsch admits, and it cost Echo Bay $1.5 million, "but we got the damn thing built. And every year now it gets a little easier for us." Putting in the road and keeping it open long enough to haul some 850 truckloads of freight still takes the efforts of a 37-person crew and about $750,000 every year, but Echo Bay estimates that by transporting all their heavy freight by truck instead of plane, the company realizes a net savings of more than $3 million annually.

In spite of the powerful wallop winter delivers to the Northwest Territories (even at the relatively southerly latitudes around Yellowknife, the temperature might not climb above –40 F for six or seven weeks straight), the substantial insulating effect of a two-foot snowpack will prevent a lake surface from freezing thick enough—at least three feet—to support 50 tons of truck unless that snow is removed. The first order of business in opening the winter road, therefore, is to plow the lakes that regularly have the thinnest ice.

The lakes most likely to be plagued with chronic thin ice lie along the southern, distinctly warmer third of the road, where the countryside is entirely below the treeline. It is here, in the dark days of mid-December, that the road building commences.

If the temperature stays at or below –31 degrees F, a lake plowed down to bare ice will accrete as much as an inch of ice per day. Plowing a lake for the first time, however, is something of a Catch-22: until you plow it, you don't know if its surface will support the weight of the plow. Flaumitsch's crew gets around this as best they can by using a light plow for the first pass, and periodically drilling holes in the lake surface ahead of the plow with a gasoline-powered auger to make sure the ice is at least a foot thick, which is considered the minimum thickness for safe passage in a light vehicle.

The lakes are not only warmer in the south end, but smaller, too, with longer and more frequent overland portages between them. The portages present headaches of their own: boulders must be blasted out of the way, grades cut, trees removed. Although the same portages are used year after year, they always need further grading, and throughout the season the big trucks continually corrugate them with spine-jarring potholes, which must just as continually be filled. The latter is accomplished with a mix of gravel, snow and water—a concoction, says Flaumitsch, that in the intense cold "sets up just like concrete."

The most serious problems created by the portages occur where they abut the lakes. As a truck- or plow-generated wave surges beneath the ice into the shallow water near a portage, it builds like surf on an ocean beach; if it builds enough it can cause an explosive "blowout" that shatters the ice for as much as 50 yards around the approach to a portage. When that happens, a vehicle often ends up in the drink, although, as a road-crew foreman named Floyd (Hawkeye) Richardson points out, "it's not the truck that causes the blowout that's going to go down—it's the poor unsuspecting bastard right behind him." Sometimes, if it's cold enough, a blowout can simply be left alone for a couple of days and it will weld itself back together; other times a new roadway must be gingerly plowed around the blowout, and if access to the existing portage has been cut off, a new one must be cut.

Broken cobblestones and windrows of ice

Along the colder northern portions of the route, the lakes are big and generally well frozen, and the portages few. Here, the greatest challenges Flaumitsch's crew must face are occasional 12-foot-high pressure ridges (where ice has piled up on itself) and, above all, the winds that scream unabated across the barren lands. As the ice begins to form in the fall, the wind repeatedly breaks it up into jagged shards and they eventually refreeze into a treacherous, rock-hard surface resembling broken cobblestones. Not only are such surfaces less than pleasant for truckers to drive over, but they also wreak havoc with the road crew's plows: according to a welder named Al Morris, on the winter road, between the hellish cold and the beating the machines take from the icy cobbles, pieces of three-inch steel on the plow blades regularly "shatter like peanut brittle."

To make it more difficult for the wind to drift the road in, the roadway on the northern lakes is plowed out to the dimensions of a six-lane interstate. Nevertheless, Flaumitsch despairs, "you can have a road 50 feet across, and if a big storm comes up, after a few hours you won't be able to tell it was ever there; to re-

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Although the thicker ice of the lakes in the barren lands lessens the likelihood that a vehicle will wind up in the water, perfectly solid ice cannot be guaranteed anywhere on the winter road. In mid-January of this year, 29-year-old Gary McOuat, an easygoing plow driver with a bushy blond mustache, was opening up the road across an expansive body of water called Sauvage Lake, 140 miles from the gold mine, when, he says, "all of a sudden there was this jolt, and the front end started going down. I was out the door in three seconds." Approximately a mile from shore at the time, he expected the big plow to disappear beneath the ice, but it had broken through directly above a hidden reef and wound up coming to rest in only five feet of water, leaving the cab high and dry.

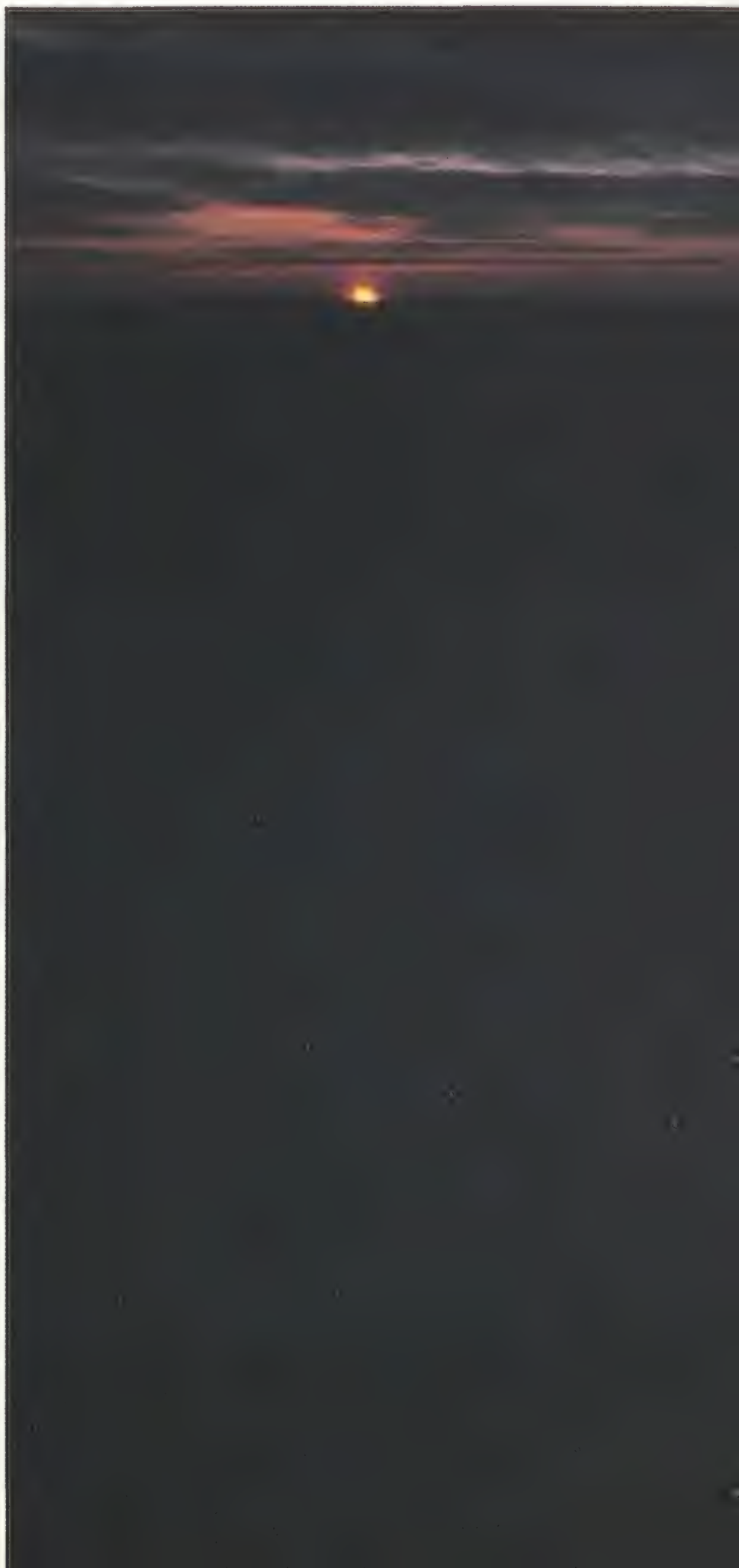
To get the plow out, Flaumitsch first waited two weeks for it to freeze into the ice—"Once they fall through," he explains, "you can't get close enough to pull them out until things freeze solid again"—then hauled it out with another truck after setting off some judiciously placed explosive charges to break the plow free. "It's a real tricky operation," he admits. "If you don't know what you're doing you can blow the whole truck up, but the man who sets the charges for us, young Marvin Robinson, has had a lot of practice at this sort of thing by now."

Indeed. Vehicles do sometimes drop through the ice, and some veterans of the Great White North hardly blink when it happens. A colleague of McOuat's named Edmund Curtois, a white-haired French-Canadian grader operator in his 60s, is one such veteran. Curtois (who likes to show off a snapshot of himself standing out on the winter road with a big grin on his face, on a day when the thermometer reads 65 below zero, attired only in hat, mittens, boots and a pair of jockey shorts) maintains that if you keep your wits about you, breaking through the ice is "no big deal."

Curtois tells about the time he was driving a D8 Caterpillar on a frozen lake in northern Quebec when the thing broke through the ice without warning and sank to the bottom, 60 feet beneath the ice, "like a 50,000-pound brick. The suction of the machine going down pinned me in the operator's seat until the Cat hit the bottom," he says, "but then I popped back up to the surface in the middle of the hole where I'd gone in. So, you see, there is nothing to worry about!"

McOuat, however, remains unconvinced. While the road crew was waiting for his half-sunken plow to freeze into the ice, McOuat was dispatched to the gold mine to bring down the machine that would pull it out. On January 22, he was hauling a bulldozer on a trailer across the south end of Contwoyto Lake, two miles from shore and perhaps 90 miles from the scene of his earlier mishap, when he experienced a sickening déjà vu: the ice was giving way and the truck was going down underneath him.

McOuat dove from the cab with his heart in his mouth, only to see that, once again, his truck had gone



In the cold of a 10:30 sunrise, Morin hefts the end result of all the effort: a half-million-dollar ingot.

in no deeper than the axles. This vehicle was also pulled from the ice without incident, but McOuat—who by then had been given the nickname Splash by his partners—was shaken. "The first go round was rough enough," he allows. "When I went in a second time, just a few days after the first, it really made me think twice about sticking with this kind of work. Traveling on this ice, I don't know. . . . You start wondering if it's worth it."

Flaumitsch confesses that dealing with risk on a daily basis is something that's difficult for some people to come to grips with. "Earlier this winter," he says, "we had one trucker, a new guy, he got partway up here and got so scared he just turned around and went home. Didn't want any part of it." But a little fear, Flaumitsch adds, is a useful thing to have on the winter road: "It makes people cautious. And if there's one thing you never want to be, it's real brave on the ice."

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By Israel Shenker

Marks & Spencer, the 'uniquely-British Aunty'

From an immigrant peddler's tray, M&S has grown into what may be the world's busiest, best-run department store chain

In 1984, after an IRA bomb came close to wiping out the British Cabinet gathered in Brighton for a Conservative Party conference, the deputy chairman phoned the head office of Marks & Spencer, and the Brighton store opened an hour early, at 7:30, with cleaning crews pitching in as salespeople. Ministers and party colleagues, who had lost their belongings in the early morning explosion at their hotel, turned up in pajamas. Hardly anyone had rescued his wallet, so new wardrobes were provided on credit. M&S even distributed disposable razors so that the men could shave in the store's washrooms.

That is the kind of service that the British have come to expect from Britain's foremost department store chain.

Napoleon may have been contemptuous of the English, calling them "a nation of shopkeepers," but for the greatest of those shopkeepers there has been no looking back. In 103 years, once-lowly Marks & Spencer has conquered a unique position in its homeland and has extended its dominion to Napoleon's very own France. Beachheads are now being consolidated in the former colonies and, barring a new ice age or interplanetary warfare, more will follow, up and down the malls of America.

The *Guinness Book of World Records* has called the M&S Marble Arch flagship branch in London the "department store with the fastest-moving stock in the world." The *Guardian* lauds M&S as "a uniquely-British Aunty . . . trustworthy, fair-minded and scrupu-

Ground floor of the flagship store at London's Marble Arch is awhirl with customers and commerce.

The store, one of 269 Marks & Spencer outlets in Britain and four other countries, sells everything from prawn salad to pajamas, has been reckoned to move goods faster than any similar store anywhere.

Color photographs by Michael Freeman

After escaping pogroms in Poland, peddler Michael Marks borrowed £5 to found the company in 1882.

Michael's son Simon (left) and his sidekick Israel Sieff guided M&S growth and quality for a half-century.

lously conscious of hygiene." Other enterprises may be patronized, even admired; Marks & Spencer (known as Marks & Sparks) is loved. Just to ensure that no one else capitalizes on that affectionate variation on the official moniker, M&S has registered Marks & Sparks all over the world. Libby Purves, a prominent British broadcaster-journalist, calls it a "dear old reassuring pussy-cat" of a store.

Management guru Peter Drucker once suggested that M&S worked for the "subversion of the class structure of nineteenth-century England by making available to the working and lower-middle classes upper-class goods of better than upper-class quality." When a columnist from the *Times* visited the Duchess of Devonshire at Chatsworth, the conversation drifted to the subject of shopping. "I expressed admiration for Harrods," he reported. "The duchess preferred Marks & Spencer—much more professional service." On television, the Prime Minister was asked where she buys her underwear. "Why, Marks & Spencer, of course," Margaret Thatcher replied. "Doesn't everyone?"

Even the royal family bends the knee. In my own less than exalted circle, where the curtsey languishes, things have come to such a pass that almost everything I wear and eat comes from one of Marks & Spencer's

Marks' first partner was burly Tom Spencer, a cashier who put up £300 and supervised company warehouse.

Oldest operating M&S, the "Original Penny Bazaar" in Newcastle, born in 1890, is still going strong.

269 stores. Occasionally I wander into London's Fortnum & Mason. Celebrated for exotic foods from all corners of the globe, it merchandises snobbery as does Harrods, which also prides itself on the range of its stock. Harrods salesmanship has its own charm, I will admit. Customer to clerk: "I want to buy a lighter for my mother." Clerk: "Is she strong?" Customer: "Not especially." Clerk: "I'd suggest matches."

When friends arrive from America, I rush them from the airport to the nearest M&S. What greets them there is not a vast emporium like Macy's or Harrods, but a glass-fronted, wondrously clean, brightly lit store of walkable dimensions, where it is easy to survey the broad aisles, orderly counters and extraordinary neatness. No one comes forward to offer help, and no customer is ever pressed to buy, but when anyone asks for assistance it is promptly and courteously given.

While British standards of retail service declined, M&S's climbed steadily. Policy on returns is the most generous in the country, probably the world. Until recently, customers got no receipt when they paid and thus did not have to produce one upon returning merchandise. Anything purchased at an M&S store may be returned even months later to any of the company's stores in the same country—no questions asked.

The author, who writes frequently for SMITHSONIAN, *lives in Scotland and buys at M&S whenever he can.*

In 1882, such success would have seemed an impossible dream to a frail, 23-year-old refugee named Michael Marks, fleeing to Britain from pogroms in Russian Poland. With £5 in credit from Leeds wholesaler Isaac Dewhirst, he began traveling through nearby villages as a peddler, selling buttons, thread, pins, needles and stockings from a tray around his neck. After two years he had earned enough to take a 6-foot-by-4-foot stall in the Leeds open-air market, displaying his wares in baskets from which customers helped themselves. Since his English was rudimentary, he posted a notice: "Don't ask the price, it's a penny."

After expanding to other markets, Marks decided he needed a partner, and Dewhirst recommended his cashier, Tom Spencer, a burly, convivial man with a talent for organization. Spencer put £300 into the partnership, helped run their eight penny bazaars, and supervised the company warehouse. By 1901 M&S had 24 stalls in covered markets, and 12 shops, including three in London. When Marks was told of pilfering at the first shop in London, he responded, "Have they left the baskets? . . . Then fill them up again."

Far-flung quality control is practiced by Ben Hood (right) checking cod catch of store supplier in Iceland.

Marks had married in 1886 and son Simon was born two years later, the first of five children—all the rest were girls. At once authoritarian and ambitious, Simon Marks, who joined M&S just before his father's death in 1907, thought about the company night and day. Simon had a fearsome temper, but also a sentimental side; he gave up reading Dickens because of the author's depiction of poverty and suffering.

One of his most notable initiatives was to entice his best friend, Israel Sieff, into the company. "I've nobody to talk to," Simon explained, so Sieff proposed that he leave his own prosperous family business for a year. "But what would your mother say?" Simon asked anxiously.

Sieff, who was to spend the rest of his life with M&S, was a former school chum and neighbor. Lifelong friends, and ardent for business, the boys married each other's sister. Rebecca Sieff later complained that the two men arranged their marriages to be able to spend the maximum time together with a minimum of marital inconvenience. Three of Simon's sisters married men who became directors of M&S and, as a doctoral thesis on the company later noted, these family ties meant, in effect, that the board was "in continuous session."

During World War I the board met in Preston, where Private Marks was stationed. After World War II service, in which Israel's son Michael rose to the rank of colonel, he—like many other ex-army officers—continued to cite his rank in civilian life. A favorite company anecdote has it that answering the phone one day in his office at M&S, he routinely announced, "Colonel Sieff here." "Private Marks here," rejoined Uncle Simon; "come into my office."

In Chiswick, Slough and Maidenhead

Simon Marks used to turn up at stores unannounced, ready to voice his criticism. His weekend itinerary to his country home was known as the royal route, and store managers at Chiswick, Slough and Maidenhead would brace themselves. At Monday morning board meetings he would produce merchandise that offended and offer pungent commentary. He liked classic clothes, had no patience with frills and could spot a ragged hem at 50 paces. Objecting to the strawberries he saw in one of the stores, a story goes, he learned that they came from Israel Sieff's farm, yet ordered them removed anyway. He disliked bananas that resembled boomerangs and announced that he wanted straighter bananas; the word went out.

With inflation, the old penny limit was shelved, replaced by five shillings, and eventually limits were scrapped. To keep prices down, though, the company sought to bypass wholesalers and deal directly with

DEWAR'S PROFILE:

ALESSANDRA FERRI

HOME: New York, N.Y.

AGE: 23.

OCCUPATION: Principal dancer, American Ballet Theatre.

HOBBY: "Trying to find the time to have one."

LAST BOOK READ: *Hopscotch*, Julio Cortazar.

LATEST ACCOMPLISHMENT: Dancing the lead in *Romeo and Juliet* and *Giselle* during the ABT's latest season. No mean feat.

WHY I DO WHAT I DO: "All little girls want to be ballerinas; I just never changed my idea."

QUOTE: "I'm Italian, and we're never neutral. About anything."

PROFILE: Focused, passionate and strong-minded. At ninety-seven pounds, she's nobody's weakling.

HER SCOTCH: Dewar's® "White Label"® and Perrier.® "After the barre, the bar. Where would you go to stretch out?"

At tasters' lunch in London head office, M&S staff samples flavor of two rival brands of imported prawns.

In the food laboratory, technician Pat Price uses a hypodermic to check gas content of a meat package.

manufacturers. On his fourth try, in 1926, Israel Sieff was admitted to the presence of the chairman of Corah, a large Midlands clothing manufacturer, who told him, "I don't do business with bazaars." But one manager had heard Sieff's argument for buying large quantities direct from the producer and made a deal.

Today about a thousand suppliers, many producing exclusively for M&S, work closely with the company, submit to frequent inspections and follow minute specifications. Harry Djanogly recalls the day, many years ago, when M&S returned a package of socks. One sock was slightly creased, and the message was clear: this was not good enough. Djanogly mended his ways —and his socks—and went on to head a company with 13,000 employees. Another big supplier is garment manufacturer Dewhirst—105 years after the £5 loan to Michael Marks. A score of companies have now been supplying M&S for more than 50 years.

In 1971, when the company wanted to develop a suit department for men, it found British manufacture moribund and had to buy 90 percent abroad. Thanks to M&S patronage, the suit industry revived and 60 percent is now domestic production. Gone—along with the great pool of skilled, immigrant tailors—are the days when good tailoring was exclusively made-to-order. For the cost of a single bespoke suit from Savile Row, M&S provides anywhere up to a dozen well-crafted, mass-produced models. The company assiduously buys British; it wants to encourage employment to provide customers with money to buy its products. Ninety percent of M&S clothing, housewares and food that can be grown in a temperate climate comes from Britain.

Though Simon Marks did not want to be known as a grocer and frowned on check-out counters, the food selection kept expanding. When M&S tried to popularize grapefruit in the 1930s, most Britons did not know what to make of them and tried peeling them like oranges. To help out, M&S distributed explanatory leaflets with the fruit, according to company archivist Paul Bookbinder. M&S made the avocado popular, as well. The company's convenience food—cooked dishes, chilled or frozen, gourmet quality at popular prices—has revolutionized British eating habits.

Today food handlers are not permitted to wear jewelry except "plain band wedding rings and sleeper earrings." They wear "no pendant or stud earrings, rings with stones, neck chains or watches," all viewed as "potential foreign-body hazards and likely to harbor microorganisms." One M&S food technologist spends months inspecting prawns in Norway and Greenland. Another was dispatched to Paris to determine why French croissants tasted better than British, tracked the dough through every step and rushed back with samples so that by 9:30 A.M. executives could savor the alien flavor. Pizzas from Italy, copied faithfully, were less successful. "Too authentic," suggested food selector Lindsay Hancox.

Every complaint about food goes onto a computer printout, graded J (justified), P (presumed justified) or, very rarely, N (not justified). Nigel Finn, who runs food services, says, "We believe what customers tell us, and we don't try to be legalistic and defensive."

Four M&S chefs work with suppliers to monitor quality and develop new products. I wandered in just before lunch one day, in time to taste the vegetable pie. With the heady feeling that I might now influence a nation's cuisine (and since I don't really approve of

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eating healthful things like vegetables), I casually observed, "Too many courgettes." Chef Malcolm Laird's expression changed into a big N, and he politely suggested that courgettes (zucchini) provided a welcome, natural color.

M&S spurred British farmers to go abroad and learn the ways of iceberg lettuce; it now buys much of its supply locally. On being told that the Amsterdam carrot could be produced only in the Netherlands, Marcus Sieff, who presided over expansion of the food department, objected that soil and climate were similar in East Anglia. A British farmer met the challenge and developed a business that has grown from carrots to other vegetables and prepared foods, from 20 workers to 1,100, and from £84,000 a year to £20 million.

Giving dyes the third degree

M&S eventually moved its burgeoning headquarters to Michael House on London's (and Sherlock Holmes') Baker Street. There, in a complex of laboratories for developing and testing, M&S has applied itself to improving fabrics and to providing wool garments that are machine washable: this to allow customers to wash clothes often and wear dressy clothes to work. Raw materials—cloth, buttons, threads, zippers—are tested to a fare-thee-well. Technicians assess the mayhem wrought on socks by trouser legs and give dyes the third degree because many people put the wash into the machine and then leave it lying there while they do other things.

M&S even asked the British Meteorological Office to supply specifications for the standard British shower ("moderate rainfall" 0.5mm to 4.1mm per hour; "heavy rainfall" 4.1 to 10.2; "heavy shower" 10.2 to 50.8; "violent shower" above 50.8) and subjects rainwear to trial by a rain machine. Occasionally, the company is left high and dry. On her honeymoon, an employee told me, a woman used bath foam that had passed every test. She was green for three weeks. M&S paid for a second honeymoon.

One evening, Simon Marks happened by an M&S store after closing time and was surprised to find two women still at work updating stock cards. Then, another time, he asked a store manager for some information; the luckless fellow opened a file cabinet and a big batch of forms—previous years' records—tumbled out, conjuring up the painful vision of legions of salespeople laboriously filling out forms to draw merchandise from the stockroom.

Having mulled long enough, Marks acted. Promising—this was 1957—that no one would be made redundant, he launched Operation Simplification. Unnecessary forms were eliminated. Store managers no longer sent long weekly reports to headquarters; for

At his clothing factory in Leechmere, Alistair Dewhirst (right) talks over quality with the manager.

In the textile lab, plastic legs in different sizes are employed to test the strength and fit of M&S socks.

Dewhirst is grandson of man who lent Michael Marks £5 to start M&S—which still buys from Dewhirst.

A "mace" test for fabric: batter it with spiky steel balls to check its resistance to snagging on sharp edges.

exact figures, job lot approximations were substituted. Individual items did not have to be counted against an invoice. The company decided that people thrive on trust; salespeople drew stock on their own. Time-clocks were eliminated; punctuality improved. From Baker Street the word went out: "Keep it simple." Phones at Michael House are still adorned with stickers directing: "Be Brief/Go Straight to the Point/ Don't Hang On."

Operation Simplification eliminated 26 million pieces of paper a year. Naturally, in 1970, when the government wanted to introduce efficiency into defense purchasing, it turned to M&S. The company lent them executive Derek Rayner, and for three years he ran government procurement. In 1979 Prime Minister Thatcher enticed Sir Derek—knighted after his initial service—back again to cut more red tape. It has been suggested that she would sometimes like to hand over the entire British government to M&S, which might not be a bad idea.

"Can you do something about it?"

The drive for efficiency was to have an effect on the company treatment of workers. Some 50 years ago, Simon Marks and Israel Sieff came across a sales assistant working during her lunch break because she couldn't afford a meal. The result was subsidized lunches and a welfare system expanded under the management of Flora Solomon. She had met Simon Marks at a dinner party and, with devil-may-care insouciance, informed him that working conditions for his employees were less than ideal. Marks was furious but responded in character: "Can you do something about it?" And put her on staff.

During World War II, Solomon launched low-price restaurants (at Churchill's prompting, the name became British Restaurants). The canned stew intended as restorative for those made homeless by bombing was dignified as Blitz Broth, and Solomon became known as the Lady of the Ladle.

Today, M&S employees get a three-course lunch, morning coffee and afternoon tea for 40 pence—about 65 cents. Almost every branch has an employees' hairdressing salon. Dentists come twice a year. Even before Britain socialized medicine, doctors visited each store for consultations about once a week, as they still do. Cervical cytology and breast screening are available for all women, including retirees and wives of male employees. The company provides a noncontributory pension, free life insurance and profit sharing, not to mention a Christmas bonus of four weeks' salary. Fathers get a week's paternity leave. Workers are free to join unions, but virtually none do, and there has never been a strike.

Jane Cristofani in customer services mollifies an irate client. At right is a note from one she helped earlier.

During the Depression, a Baptist minister in Wales wrote that hardly any of the men in his village of Mountain Ash owned a decent shirt. Off went a gift of 6,000 shirts. Thanks in part to such practical generosity and what might appear to be an outmoded philosophy of service, M&S is now Britain's largest retailer. It is the nation's biggest fishmonger, the biggest shoe store, the biggest haberdasher, the largest clothing exporter (selling even in Singapore, Japan and Hong Kong—where it is going to open its own stores). Sales for the year ending March 31, 1987, were £4 billion ($7 billion): 49 percent clothing, 39 percent food, the rest housewares and other products. M&S green-and-gold shopping bags (white for food) are instantly recognized all over Britain and beyond, since the stores are a magnet for foreigners as well as natives. There is such a babble of foreign tongues in the Marble Arch store that one plaintive British shopper was overheard saying to a saleswoman, "I'm sorry, I'm afraid I only speak English."

There are nine M&S stores in Europe (seven in France and two in Belgium), one in the Irish Republic, and the company is studying moves into other countries including West Germany and the Netherlands. The Paris store on the Boulevard Haussmann has the highest sales per square foot of any department store in France, and the line includes food—even bread—made in Britain. M&S has considered negotiating a deal in Prague, so one day we may have fresh evidence that the true revolutionaries are not Marx and Engels but Marks and Spencer.

When Marcus Sieff was asked, several years ago, if M&S got any complaints, his response was characteristic. Yes, he said, and 95 percent were justified. "In 99 percent of the cases, we'll give the benefit of the doubt to the customer," says Jane Cristofani, who heads customer services for everything except food. Last year her team dealt with 64,000 letters and 47,000 telephone calls, a great number conveying not displeasure but praise. The company often phones customers at home with responses to their letters, and written replies are also delivered speedily. Heidi Pook, age 7, sent a poem with the sad news that her aunt had bought her Noddy storybooks 1, 2 and 4, but was unable to find Noddy 3. Customer services' Alison J. Collins sent the book along, together with six verses about how

> Wiggles cast a magic spell
> To freeze the dragon's jaws
> And silently the book was snatched
> From 'neath the mighty claws.

Richard Crossman, a Labor minister, used to call the company "Simon Marks and the Forty Sieffs," and when Simon (by then Lord) Marks died in 1964, he was replaced by three Sieffs in a row: Israel, his brother Edward, and Israel's son Marcus. The two Lords Sieff, Israel and Marcus, were the only father and son each awarded a life peerage. Simon Marks' son Michael might have had quite a future at M&S, but he preferred poetry. If he were to write his memoirs, he said, the title would have to be *I Am a Fugitive from a Chain Store.*

In 1984, Marcus resigned as chairman, and revolutionized management by handing over the direction of the company to Lord Rayner, someone outside the family, who is as eager as the Sieffs to preach the gospel according to M&S. At present only 3 of 17 directors belong to The Family. If a penniless immigrant, unable to speak English, arrived at the imposing head office on Baker Street and asked for a job, goodness only knows if the answer would be yes.

The way of course has been easier for the founder's grandson. When President François Mitterrand of France paid a state visit to Britain, Marcus Sieff and his wife were invited to the luncheon given by Prime Minister Thatcher. Lady Sieff wondered aloud to the French Ambassador, seated next to her, why she and her husband had been invited. The ambassador's reply was diplomatic, but not persuasive. Reflecting, Lady Sieff suggested an explanation of her own: "Napoleon called England a nation of shopkeepers; we are here representing the nation."

Display of items from M&S's early "everything for a penny" bazaars includes tacks, crayons, XMas candles.

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CRAYONS
FULL SIZE
EXTRA
QUALITY
PENNY
Paper Clips

Estate of Georgia O'Keeffe

By Jo Ann Lewis

GEORGIA O'KEEFFE

To mark the centennial of the birth of one of our most remarkable artists, the National Gallery mounts a brilliant show

Georgia O'Keeffe, age 95, sat alone in a small room off the National Gallery's East Garden Court, separated from the opening night crowd by a red velvet barrier rope hung discreetly, but with unmistakable purpose, across the marble doorway. Ramrod straight, gaze fixed on a distant wall, she looked every inch the national monument she had become.

The occasion was the February 1983 opening of the exhibition "Alfred Stieglitz Photographs," a collection that O'Keeffe, as Stieglitz's widow, had donated to the National Gallery. Her presence was a final act of devotion to the legendary photographer and art dealer who had launched her career more than six decades earlier.

Among the Stieglitz photographs on view that night were some of O'Keeffe taken during those first, passionate days of their affair—studies of her dramatic face and loosened hair, her graceful hands and angular nude body. One could only marvel at the extraordinary life and career that had transpired since, transforming that open, passionate young woman into the legend behind the velvet rope.

O'Keeffe's art, as well as her legend, has endured for nearly three generations, periodically refreshed by new exhibitions and publications and a television special. Now a new wave has been launched with the

Stylized *East River from the Shelton* was done in 1928 when O'Keeffe lived on 30th floor of Shelton Hotel.

National Gallery of Art

As casual a picture of O'Keeffe as you are likely to see was taken by Stieglitz at his family's summer home at Lake George, New York, in 1918. Opposite: A study made by photographer William Clift in 1981.

opening on November 1 of the National Gallery's Centennial Exhibition of Georgia O'Keeffe, marking the anniversary of her birth on November 15, 1887. It was a birthday O'Keeffe had hoped to see, but she succumbed to old age at 98. A selective and focused survey of her best work rather than a definitive retrospective, it is the first major O'Keeffe show since 1970, and the first to be assembled largely out from under O'Keeffe's ever-controlling thumb. Accompanied by the publication of 125 of O'Keeffe's surprisingly frank and endearing letters, this celebratory enterprise should go a long way toward blowing enough dust off the stony legend to reveal the full sweep and range of both the art and the extraordinary woman who made it.

After it closes in Washington on February 21, 1988, the show will travel to the Art Institute of Chicago (March 5 to June 19), the Dallas Museum of Art (July 31 to October 16) and the Metropolitan Museum of Art (November 19 to February 5, 1989).

An early Modernist, O'Keeffe worked in the realm between realism and abstraction, and often in series, constantly simplifying and distilling what she saw into clean lines and simplified forms. Though there were influences—from both American and European Modernists—she was essentially an original.

She has been perceived differently over three generations: first as Stieglitz's chaste femme fatale; later as the desert recluse who painted the cliffs and hills, the bones and stones of northern New Mexico; and, most recently, as an early feminist, an independent, self-sufficient and liberated woman.

In fact, O'Keeffe was all of them.

She grew up on a dairy farm near Sun Prairie, Wisconsin, the second of seven children of a land-rich but luckless Irish Catholic father and a half-Hungarian, half-Dutch, Protestant mother who put great importance on her children's education. At age 11, her talent evident, O'Keeffe was taken by buckboard to a nearby town for weekly art lessons. By 12 she had told a playmate her mind was made up: she would be an artist.

After boarding school in Virginia, where her family had relocated, O'Keeffe spent a year at the School of

the Art Institute of Chicago, and another at the Art Students League in New York, where she studied with American Impressionist William Merritt Chase.

She also had her first glimpse at the future that year—1907—when she visited, for the first time, Stieglitz's Little Galleries of the Photo-Secession at 291 Fifth Avenue (known as 291), headquarters and bridge for the pioneering European and American avant-garde. It was here, during this and later visits, that O'Keeffe first saw the works of Rodin, Matisse, Cézanne, Picasso and Americans Arthur Dove, Marsden Hartley, John Marin and Charles Demuth. Nearly a decade was to pass before she came back to stay—the first and only woman ever to join Stieglitz's celebrated circle—but it proved to be her breakthrough decade.

After a year as a commercial artist in Chicago, O'Keeffe attended a summer class at the University of Virginia under Alon Bement, disciple of design theorist Arthur Wesley Dow, who had studied with Gauguin at Pont-Aven. Dow had abandoned the traditional approach to art training, instead encouraging students to invent their own forms and express their own feelings, using the Oriental principles of patterning, simplification and harmony. Dow's concept of "filling a space in a beautiful way" proved liberating for O'Keeffe.

Over the next few years, she held down various teaching jobs in Virginia, South Carolina and Texas, where her ecstatic relationship with the landscape of the American Southwest—West Texas in particular—was ignited.

In 1915, she sent her friend Anita Pollitzer some black-and-white charcoal drawings using biomorphic forms she said she had often seen in her mind, and in which she hoped to capture the abstract expressive power of music. Pollitzer, in New York, took them to 291. As she later wrote, Stieglitz looked and said: "Why they're genuinely fine things—You say a woman did these—She's an unusual woman—She's broadminded, she's bigger than most women, but she's got the sensitive emotion—I'd know she was a woman—Look at that line . . . tell her . . . they're the purest, finest, sincerest things that have entered 291 in a long while." He fell immediately in love with O'Keeffe's drawings, then with her letters and, finally, with the dimpled, dark-haired woman herself. "At last," he often said, "a woman on paper!" And an American woman at that. Stieglitz had long believed that there was an authentic American spirit to be expressed, and here it was—born and bred in America.

O'Keeffe's euphoria, not only with the Texas landscape but with Stieglitz himself, is made clear in an especially open and revealing letter written to him in September 1916 from Canyon: "The plains—the wonderful great big sky—makes me want to breathe so deep that I'll break—There is so much of it—I want to get outside of it all—I would if I could—even if it killed me." The letter concluded, "Your letter coming this morning made me think how great it would be to be near you and talk to you—you are more the size of the plains than most folks. . . ."

In May 1918, Stieglitz sent photographer Paul Strand to bring O'Keeffe back to New York to accept his offer of a subsidized year to paint. Soon after, Stieglitz, who was 25 years her senior, left his wife and daughter and moved in with O'Keeffe. Six years later, on a frigid December day, they took a ferry to New Jersey and were married. They remained devoted to each other's work and, in their fashion, to each other, until Stieglitz died 22 years later at 83. O'Keeffe never wore a wedding ring, nor did she ever answer amiably to the name "Mrs. Stieglitz."

She was a compelling, mythic presence from the start, this Wisconsin-born farm girl who wore stark black dresses and no makeup, and pulled her dark hair back in a tight knot. From her first show, O'Keeffe's abstractions had attracted critical attention, albeit with a heavy dose of Freudian analysis thrown in. Critics and public alike seemed preoccupied with the sensuous, even erotic, overtones they found in her work and which she constantly denied. Stieglitz's public showing of his collective "portrait" of O'Keeffe only further fueled the dichotomous myth of this woman who dressed like a nun but bared herself for art.

O'Keeffe, fed up with such implications, switched from abstractions in the mid-1920s to more concrete subject matter in hopes of fending them off. There were some fine paintings of New York skyscrapers. But the highly charged, closeup, oversize flowers that followed, paintings for which she became best known, only fortified the belief that, consciously or subconsciously, O'Keeffe's greatest works—be they landscapes, sunsets, flowers or abstractions—were deliberately made ambivalent.

An art critic and columnist for the Washington Post, *Jo Ann Lewis wrote about immigrant artists in the United States in* SMITHSONIAN, *May 1976.*

Right: Artist counted Ranchos de Taos Church among loveliest early Spanish buildings in United States.

Overleaf: O'Keeffe's *Iris*, 1929. She wanted to capture the essence of flowers, not describe them: "So I said to myself—I'll paint what I see—what the flower is to me but I'll paint it big and they will be surprised into taking time to look at it—I will make even busy New Yorkers take time to see what I see of flowers."

Phillips Collection, Washington, D.C.

Colorado Springs Fine Arts Center

← Fold out

Carl van Vechten Gallery of Fine Arts, Fisk University

Radiator Building—Night, New York dates from 1927. STIEGLITZ, on red band, was her whimsical tribute.

Though celebrity had helped make her financially independent within a decade of her arrival in New York, O'Keeffe hated such publicity, while Stieglitz continued generating it and, on occasion, inventing it. In 1928 he reported to the press the record sale of six small calla lily paintings by O'Keeffe for the then-astronomical sum of $25,000—a sale new evidence suggests may never have taken place. Nonetheless, it led to headlines declaring O'Keeffe the "art sensation of 1928"—headlines that may also have helped to drive her out of New York.

From their earliest days together, O'Keeffe and Stieglitz spent their summers at the Stieglitz family compound at Lake George in upstate New York, where O'Keeffe felt increasingly smothered by the throng of Stieglitz relatives and friends, and much in need of new subjects. She talked often of going to the Southwest for a summer. But Stieglitz, who traveled west of the Hudson only once, wouldn't budge.

There were other problems, occasionally reflected in paintings of the time, some made by looking from their apartment on the 30th floor of the Shelton Hotel: the claustrophobic *Street, New York No. 1,* a dour 1926 scene of towering buildings closing in; and the wistful *East River from the Shelton,* in which a sprig of leaves in a bowl on the windowsill seems trapped, struggling for sunlight against the backdrop of the smoky city (pp. 154-55).

A relationship goes from bad to worse

By 1929, her relationship with the ailing, hypochondriacal, unbending Stieglitz had grown more difficult, and it was not helped by his preoccupation with Dorothy Norman, a younger woman. Though O'Keeffe good-humoredly nursed him and wrote hilarious letters to friends about his endless physical ailments, it finally became clear to both of them that she needed a vacation from Lake George and a new source of inspiration as well.

She found it in New Mexico and, after a summer with Mabel Dodge Luhan in Taos, vowed to return. In 1932, with the world watching, a mural she was painting at Radio City Music Hall (a project Stieglitz had opposed) fell apart, and she suffered a breakdown that required hospitalization. She stopped painting for a period of two years.

When she recovered, her life changed dramatically as she took charge of it. She began a pattern of spending summers at Ghost Ranch, a dude ranch 70 miles north of Santa Fe, and winters in New York, where she could help Stieglitz, who had suffered several angina attacks. By that time O'Keeffe was in her late 40s, Stieglitz more than 70.

Her work and her spirit began to flourish once again, and critics who had run out of things to say about her began to see new excitement in her work. Surrounded by a landscape blessed with spectacular cliffs and mesas, bleached animal bones and ever-changing skies and clouds, she found new inspiration and new subject matter for her art. She also found the kind of solitude she needed, both to work and, it seemed, to live.

But not without conflict. She wrote from New York to Taos artist Vernon Hunter: "I am divided between my man and my life with him—and something of the outdoors—of your world—that is in my blood—and that I know I will never get rid of—I have to get along with my divided self the best way I can."

Then, in 1946, after opening her retrospective at the Museum of Modern Art, O'Keeffe was at Ghost

Ranch when the news came that Stieglitz was in a coma. She arrived back in New York just before he died. She spent the next day searching for a simple pine coffin and, after tearing out its offensive pink satin lining, worked into the night stitching in a new one made of pure white linen.

The Southwest had been O'Keeffe's spiritual home since she had first arrived in 1929, but after three years in New York settling Stieglitz's estate, it became her year-round home as well. Spare and harsh, but lavish in its colors, textures and shapes—its light and skies —it suited her perfectly, mirroring her own spare, pared-down esthetic. She found it, she later said, the most beautiful place on Earth. "I've been all over the world, and nothing is as good as this."

In her paintings, she so powerfully conveyed the essence of the place that it is now impossible to see the pink hills dotted with piñon trees, the striated white cliffs and looming black mesas near Ghost Ranch and not know it is O'Keeffe's land.

She hiked it endlessly, and often drove her old Model A Ford to special places, like the "Black Place," where she could put her canvas on the back seat and paint. From her patio at the ranch and from its roof, where she often climbed the wood ladder and slept, she watched and painted the dark, flat-topped Pedernal to the south—her favorite mountain.

Settling in: the rugged life at Abiquiu

Because Ghost Ranch was not habitable during the winter in those early days, O'Keeffe spent ten years convincing the Catholic Church to sell her a roofless adobe house in the tiny nearby village of Abiquiu, 17 miles south, which she eventually transformed into a winter home. There she built a huge studio, all white, and planted a vegetable garden and fruit trees that made her more self-sufficient. Life was rugged at the time and, for a phone, she walked to Bode's grocery store and gas station on the highway, then a dirt road.

To both her houses came streams of artist-pilgrims, often unannounced, and usually turned away. One was John Bruce (Juan) Hamilton, a 27-year-old potter who arrived asking for work and stayed on for 13 years as her assistant and friend, and finally as her caretaker and, by terms of the 1984 codicil to her will, principal heir to her $79 million estate—one of the largest ever for an American artist. (A challenge to that will and its codicils by O'Keeffe's sole surviving sister and a niece resulted in a settlement that reduced Hamilton's share from roughly 70 percent to slightly more than 10 percent, making the public the chief beneficiary. The remaining assets are going to a new Georgia O'Keeffe Foundation, to be headquartered in the Abiquiu house, which will distribute her works to public institutions. O'Keeffe's will had already bequeathed 42 of her major works to eight American museums.)

Private collection

At home in desert, O'Keeffe began to paint bones; a horse's skull topped with rose dates from 1932.

"The notion of her isolation was highly exaggerated, but was very useful in keeping people away," says Letitia Frank, granddaughter of Mabel Dodge Luhan, who shared float trips with O'Keeffe into what was then Glen Canyon. "She had many friends, and visitors from all over. But being a friend of Georgia, you had to accept her privacy. One violated it at their peril. She did not suffer fools."

Estate of Georgia O'Keeffe

Indianapolis Museum of Art

Opposite: Absorbed in forms of jack-in-the-pulpits, O'Keeffe did a series of six in 1930, of which this is the fourth. Above is *The Grey Hills,* 1942. A favorite place, it reminded the painter of "a mile of elephants."

In fact, O'Keeffe's attitude toward public intrusion of any sort took on a rather fearsome quality as time went on. Well off, and with Stieglitz no longer around to push her or to hold center stage, O'Keeffe retired into her own world with herself at the center. She could be difficult and demanding, ungenerous. And scholars who approached, including biographer Laurie Lisle, were usually rebuffed. "She was mean, she really was," said one old friend. "Inconsiderate. She never much cared about people anyhow."

But for those who had access, it was a very different story, and though her art was unpeopled, her life was not. Stories of her severity and austerity seem also to have been misinterpretations or exaggerations of a tendency to simplify. "It was such richness out of simplicity," said Frank—in her paintings, her language, her clothing, even her food. "Her food was very important to her. When we went on trips, she took along loaves of homemade bread full of goodness." It has been said that O'Keeffe once hauled a leg of lamb on an automobile trip to Mexico.

Her meals were memorable, with fresh-baked bread made from home-ground flour, homemade yogurt and home-grown fruits, and vegetables and herbs from the garden, which, apart from the studio, was the center of activity at the house in Abiquiu. One friend remembered buttermilk soup and sautéed tiger lilies.

She also loved Chinese food, a taste she had developed during the Stieglitz days when he would take whoever happened to be in the gallery at the end of a Saturday afternoon to a nearby Chinese restaurant, where he always picked up the tab.

"Whenever she was in New York, or in Washington, it was always Chinese food," says Olga Hirshhorn who, with her late husband, Joe, had formed the habit of spending O'Keeffe's birthday with her each year, wherever she happened to be.

"Everything she did was exquisite," says Aline Porter, a friend since the days of 291, when her husband, photographer Eliot Porter, left his teaching job at Harvard to show with Stieglitz. "Everything in the house was special, like rocks, or those perfect little sticks of piñon wood she had cut for her 17 fireplaces."

Starting at age 63, she traveled extensively, in the

last years with Hamilton, who encouraged her to continue to work despite the loss of central vision in one eye, and who also helped her publish her only book, in 1976, *Georgia O'Keeffe*, which has sold more than 230,000 copies.

One thing that made O'Keeffe such a compelling figure was the seeming consistency of her vision—the encompassing esthetic of purity, clarity and directness that pervaded not only her art, but every aspect of her life, from the landscape she chose to live in to the way she talked and dressed.

The image she projected was, in fact, so consistent that certain details came as a shock, including the fact that she bought herself a luxurious white Lincoln Continental and, later, two white Mercedes, and that she was a superb seamstress and in her youth sewed her own clothes. She also read cookbooks before she went to sleep and actually assembled her favorite recipes for a cookbook of her own. It was never published.

Also, her remarkable physical strength and vitality and extraordinary grace, not to mention her advanced age, gave her an air of invincibility that is hard to square with the blow of near-blindness that came in her 80s and forced her to stop painting.

Her friends, especially those around Santa Fe, are still wary of talking about her, remembering others who, for reasons they sometimes did not understand, were simply cut off by O'Keeffe as swiftly as she had cut off the head of an intruding rattlesnake with her hoe. "Georgia always had to have her way," said one of them. "We were great friends, but if you liked Georgia and wanted to be with her, you did things her way."

A small lizard streaked across the gray carpeting as the door was unlocked to the huge white studio in Abiquiu, the former mecca to which so many artists had made the unrequited pilgrimage. Her presence was still felt, but now as that of an old woman coping with the problems of age and the loss of sight, rather than as the iron-willed legend.

The bed she vacated to move into a big house in Santa Fe during her final years was still there in her small corner bedroom just off the studio, but her personal possessions were now neatly wrapped in plastic bags, stacked and labeled for the estate inventory: "1 black blouse," "four white cotton nightgowns." On a ledge under the large corner window were several unglazed pots, rather clumsy ones—evidence of her experiments in clay, encouraged by Hamilton.

O'Keeffe imagery was everywhere, even out the bedroom window, which looked to the east and north over the Chama River Valley and at the road she had

From her Ghost Ranch patio, O'Keeffe would look long and often at the enormous, flat-topped Pedernal.

Estate of Georgia O'Keeffe

painted as a minimal, calligraphic black ribbon in a white field, a work called *Winter Road I*, done in 1963 when she was 76.

Most of the house looked as expected—spare and white—except for the living room, which came as a complete surprise. Comfortably furnished in classics —a Saarinen Womb chair, a Mies table—there was built-in seating outfitted with square velvet cushions in rich earth tones (now faded) on the adobe wall next to the fireplace. Her collection of smooth, perfect stones filled the sill of the window that looked out over the garden, now gone to seed.

Seventeen miles north at Ghost Ranch, in the adobe house she loved best and left to Hamilton, there were dozens of well-worn shoes lined up on open shelves, a battered straw hat, a cane and another tiny corner bedroom with glass walls, the bed aimed at the best view of surrounding red cliffs to which she hiked every day, often before her morning cup of chamomile tea.

And from the patio, the great flat-topped Pedernal—her special mountain. O'Keeffe once said, "God told me if I painted that mountain enough, he'd give it to me." For nearly four decades she stared at it, climbed it and shared her feelings about it in her work. In the end, she became part of it. Though tourists wander the streets of Santa Fe in vain search of O'Keeffe, it is near Ghost Ranch that her spirit lingers, her ashes scattered by Hamilton, and now mixed with the dry dust of the landscape she found, loved and ultimately made her own.

Her favorite mountain appears here as she captured its forms in pastel. For nearly 40 years she stared at it, entranced. O'Keeffe once remarked, "God told me if I painted that mountain enough, he'd give it to me."

Quotations from O'Keeffe's letters are reprinted by permission of the National Gallery of Art and the Estate of Georgia O'Keeffe. The exhibition catalog *Georgia O'Keeffe: Art and Letters*, with essays by Jack Cowart and Juan Hamilton and letters selected and annotated by Sarah Greenough, is available at the National Gallery of Art.

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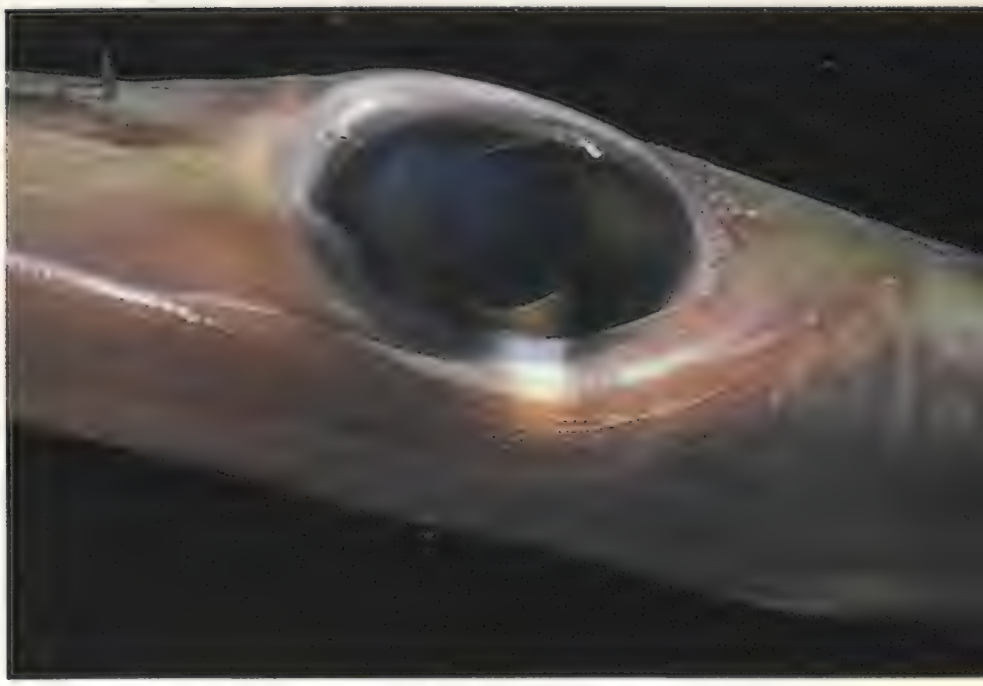
Photographs by Jeffrey L. Rotman

Optical marvels, fish eyes are visual feasts themselves

From parrot fish to groupers to sharks and rays, piscine eyes are often the central focus of dazzling combinations of patterns and textures

Because fish have to see in water rather than air, their eyes are very different from ours. The lens is spherical, rather than double concave as in humans, which explains why fish do not have to wear diving masks to see clearly. In a terrestrial eye, some of the focusing is done by the natural refraction that occurs when light passes from one medium—air—to another—the liquid in the cornea. Underwater, a terrestrial eye needs a mask to trap air to provide that refraction. In fish the shape of the lens does it instead. In most fish the spherical lens is set in an ellipsoidal eyeball, which enables them to focus on nearby objects in front of them (such as food), while to the side it is the more distant objects (such as predators) that are sharp.

To concentrate solely on piscine ophthalmology, however, is to miss the chromatic extravagance. The dictionary defines the "fisheye" as a cold and suspicious stare, but real fish eyes look out at the world from behind facial decorations that make the painted faces of punk rockers seem drab. To take the pictures on these pages, Jeff Rotman dove anywhere from 6 feet to 100 feet beneath the surface of the Red Sea and waited motionless until a curious fish came close enough to be photographed with a macrolens. The results transcend physiology.



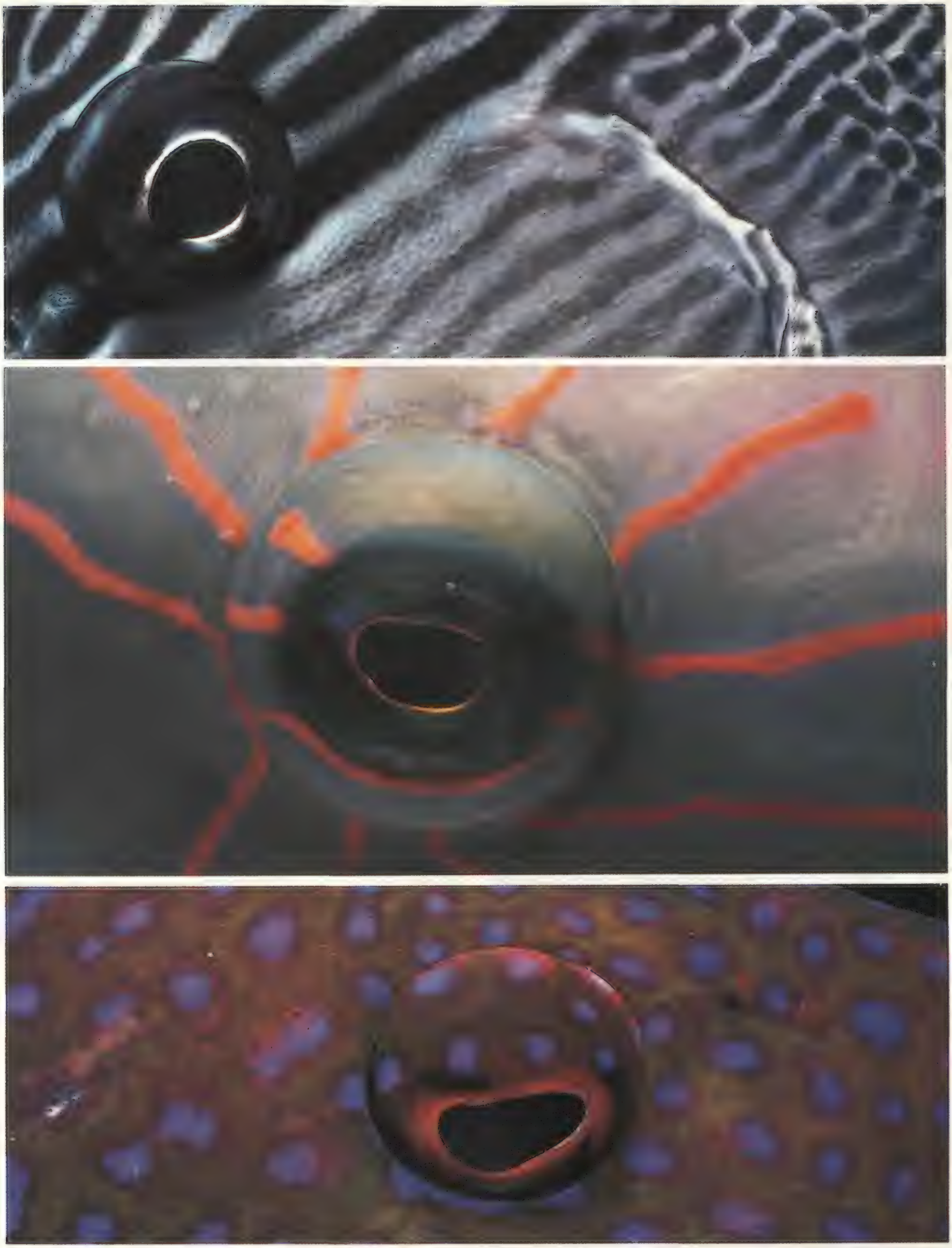
Elongated eye matches the body design of a cornetfish, which looks somewhat like a tapered section of pipe.

Bold stripes of a Picasso fish set off orange eye, which may help species members recognize one another.

Shown here larger than life is the most prominent feature of a Red Sea fish that is known as the bigeye.

Eye of a coral grouper (left) is inconspicuous in pattern of repeating spots, while that of a spiny pufferfish (below) is protected by spines—one of which is visible to left of eye.

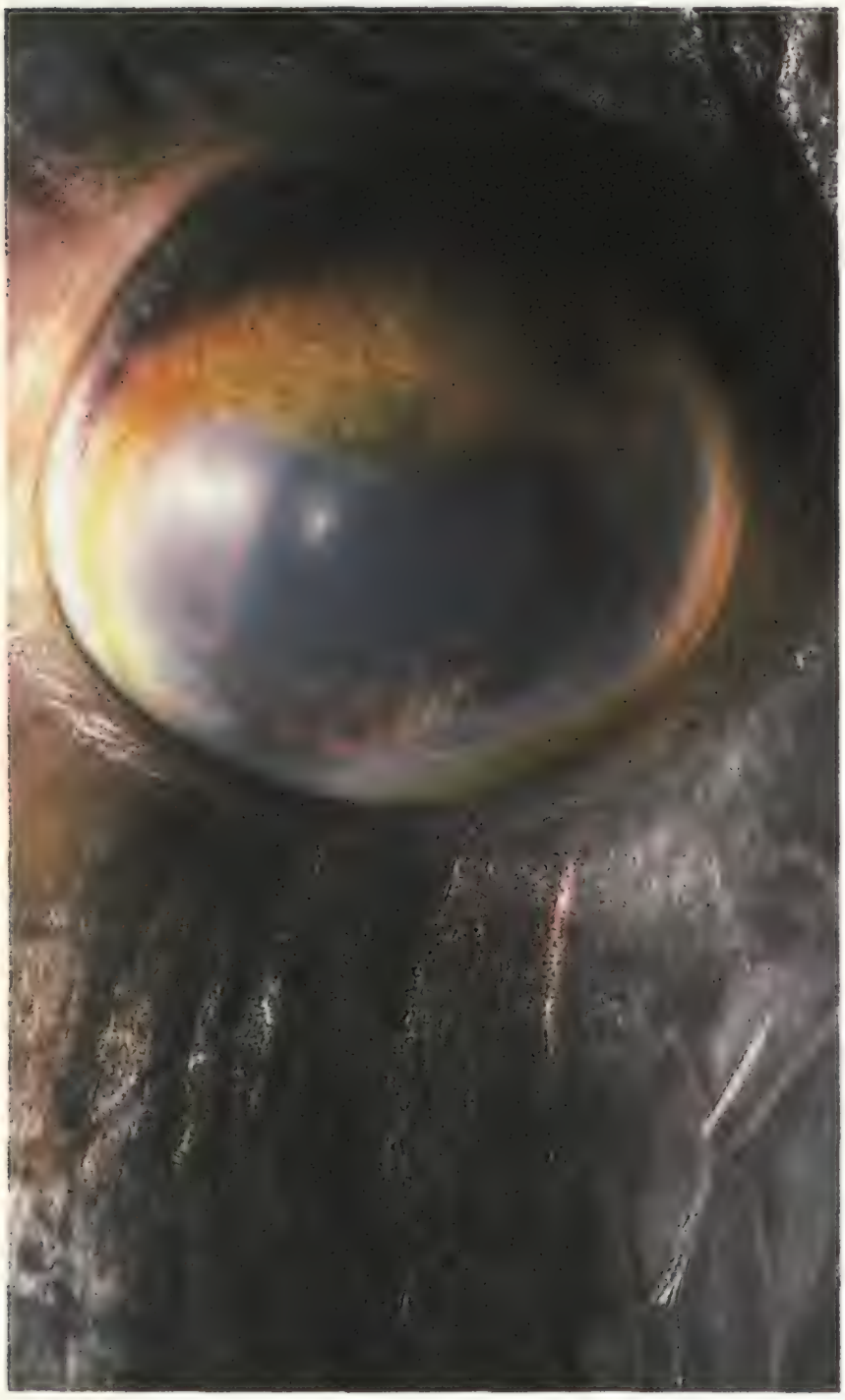
Flap protects the eye of a stingray (above, left). Slit next to it, a water intake, is a modified gill structure. Eye of a jack (right) is black in a field of chrome yellow.



Color patterns of many fish, unlike that of the jack, tend to make the eye blend in rather than stand out. These bold patterns are, from top to bottom, those of a surgeonfish, a wrasse and a different grouper.

The iris in this eye, which belongs to a white-tip reef shark, is very close to the color of the surrounding skin.

During any attack, a special membrane will cover the eye from bottom to top to protect it from injury.

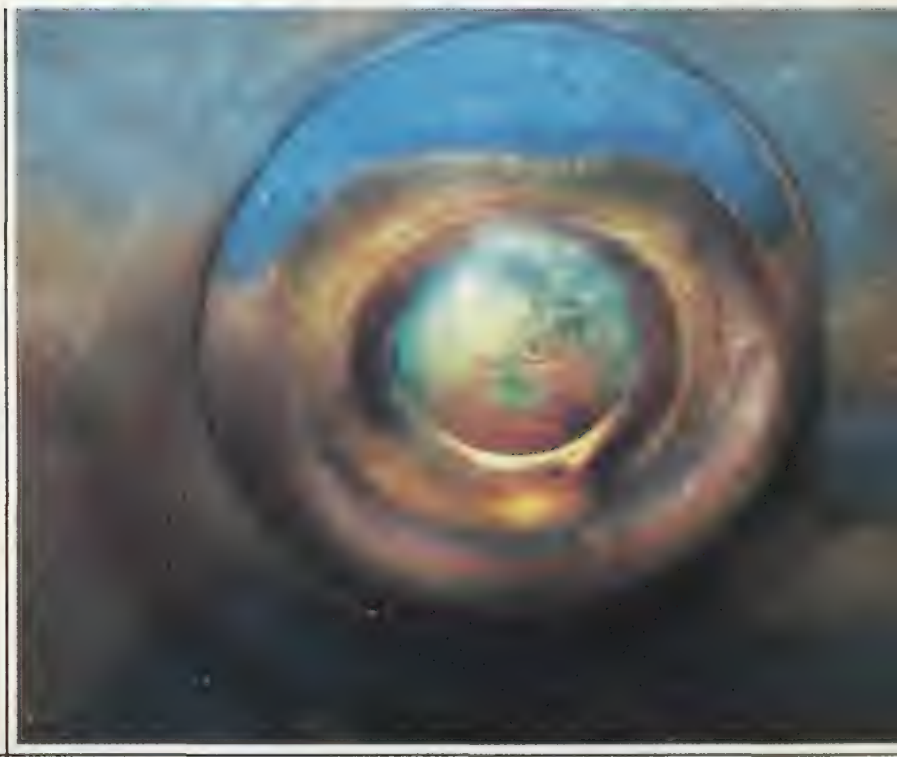


Fish do not have facial expressions, but sometimes colors may give that effect, as with this unicorn fish.

Most fish do not have eyelids, but the coloring of this sea bass makes it look as though it indeed has them.

The bulging eyes of six different Red Sea parrot fish make up a collage of brilliant hues and bold patterns.

Iridescent colors seen within some fish eyes are the result of differential reflections of light by the corneas.



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* May be deleted for credit.

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THE *Heartbeat* OF AMERICA

TODAY'S CHEVROLET

By Bennett Daviss

World of funnies is 'warped with fancy, woofed with dreams'

The comic strips have amused us for years and our childhoods were filled with their images, but now their creators struggle to keep them alive

The castle, on a hill at the end of a residential street in suburban Rye Brook, New York, is a perfect home for the Museum of Cartoon Art. The edifice, like the museum's collection—with more than 60,000 pieces perhaps the world's largest archive of original comic works—adds a dimension of magic to the familiar. The place looks as though Prince Valiant might live there, with its two-foot-thick walls and crenellated turrets. And, in fact, he does.

The concrete palace was built at the turn of the century by nuts-and-bolts magnate William Ward as a fireproof house for his mother. Now the corniced ceilings and walnut paneling frame original works by Richard Outcault and Garry Trudeau, Frederick Opper and Charles Schulz, Alex Raymond and Rudolph Dirks. An upstairs sitting room has been set aside as a research library for the growing ranks of scholars who are taking a serious look at the funnies, and a Hall of Fame honors 24 of the most renowned and influential comic-strip artists and their creations. Even the graffiti in the restrooms were custom-drawn by such visitors as Dik Browne and Johnny Hart. The graffiti, like the rest of the collection, were donated to this small, nonprofit museum that survives only because people want the comics to stay alive.

Little Nemo's dream is loaded with strip stars in a stained-glass skylight at the Museum of Cartoon Art.

In 1919, Billy DeBeck created *Barney Google*, whose riotous life was forever melodramatic and complex. Racetrack tout Google loved trusty steed Spark Plug, who brought in millions of dollars and lost same.

Everybody loves the funnies. Four generations of Americans have been introduced to reading and the habit of buying the dailies because of their popularity. They have gently teased us through four wars and eight decades of wrenching social transformation. Today, they still lead an estimated 50 million newspaper readers on exotic adventures and into a world of pure fantasy. Although comics began as simple circulation boosters during the newspaper wars of the 1890s, they've become our national diary, a running record of who we are and what we think.

A comic-strip artist has two goals—to entertain and, to make money. Success is measured by the artist's ability to amuse a New York stockbroker, a Kansas farmer and a California surfer—all on the same day. The gags and ideas reflected in the strip have to be current and mainstream; comics work because they find the public heartbeat. *Pogo* and *Li'l Abner* thrived for decades as razor-edged commentaries on American social and political mores. Today, *Doonesbury* and *Bloom County*—both Pulitzer Prize-winners—continue that tradition, while *Sally Forth* and *Cathy* document

changing attitudes toward careers and personal relationships. At their best, comics can Americanize us, notes historian Arthur Asa Berger, a kind of guru among comics scholars. "They create a national sense of belonging and identification."

But the Museum of Cartoon Art's fortresslike facade also reminds visitors that the funnies are an embattled art form. Like castles and princes, they are having trouble finding their place in a world that no longer seems particularly interested in them. They seem to be less relevant to our national conversation, thereby impoverishing us personally and culturally.

Ironically, the comics seem to be losing their collective soul just at the time their public is rediscovering it. In 1983, New York's Whitney Museum mounted a comic-art show and visitors lined up around the block. Sotheby's auctions off comic-strip originals and major New York galleries have featured them. Demand among collectors has pushed up prices fivefold for original cartoon art over the past 20 years.

It's not surprising to find university scholars and art lovers seeking to enhance their comics troves, but they aren't the only ones. "I have no greater joy in owning an original than that I remember having read it as a kid," says Richard Marschall, whose 3,000-piece assemblage ranks him among this country's leading collectors. "I remember laughing at it in the newspaper, and now to think that I have the original—that makes it very special." Marschall is the former comics editor for three national syndicates, now edits *Nemo*, a widely heralded monthly journal about comics and will be coeditor of the forthcoming magazine *Cartoon*. He has a vision that "someday libraries and even private homes will have the complete works of E. C. Segar, George Herriman and Billy DeBeck" (creators, respectively, of *Popeye*, *Krazy Kat* and *Barney Google*) "the way they now have sets of Mark Twain."

Efforts have begun. Fantagraphic Books is releasing a hardbound edition of *Dickie Dare*, Milton Caniff's first comic-strip creation, as well as the first four books of a ten-volume *Popeye*; in the works is a 28-volume set of Harold Gray's *Little Orphan Annie*.

Unfortunately, it's too late for some strips. At the turn of the century, when newspapers created their own individual comics, the sizable original artworks weren't saved and most of the papers were destroyed. "One cartoonist told me that in the early days he saw original *Barney Google*s and *Krazy Kat*s—classic, classic works—thrown by the armload into the incinerator just to clear space in a storeroom," Marschall recalls. "An old pressman told me about contests among his co-workers held back in the 1930s using originals of Milton Caniff's *Terry and the Pirates*. They would stack them and see how many they could rip in half at one time, just like circus strongmen." Fortunately some of the newspapers were kept, and today the San Francisco Academy of Comic Art, under the expert guidance of Bill Blackbeard, has collected and is preserving virtually every syndicated comic strip from the 1890s on—more than two million episodes.

In the beginning, the comics weren't considered art. They were cannon fodder in the flamboyant 1890s newspaper-circulation battles between Joseph Pulitzer and William Randolph Hearst. Both publishers experimented with single-panel "silent" comics to show off color printing. Nothing caught the public's fancy, though, until a bald, flap-eared slum urchin in a bright yellow nightshirt appeared in an early 1895 episode of Richard Outcault's "Hogan's Alley," a Sunday panel for Pulitzer's *New York World*. "The Yellow Kid," whose flippant, slang-laden comments Outcault lettered directly onto his nightshirt, was soon a celebrity (pp. 185, 186). Within months, his likeness adorned everything from lapel buttons to cigarette packs.

Hearst fought back with his most powerful weapon —his money. He lured Outcault away from Pulitzer with an enormous salary increase, but Pulitzer claimed rights to Outcault's characters. Through the late 1890s, New York's newspaper readers were treated to two versions of the same comic: "Hogan's Alley," drawn by a staff artist for Pulitzer's *World*, and "The Yellow Kid," which Outcault continued for Hearst in the *New York Journal*. The two publishers exchanged injunctions and lawsuits trying to force each other to abandon the comic. Their florid news stories of mutual treacheries prompted the epithet "yellow journalism" among a disgusted public.

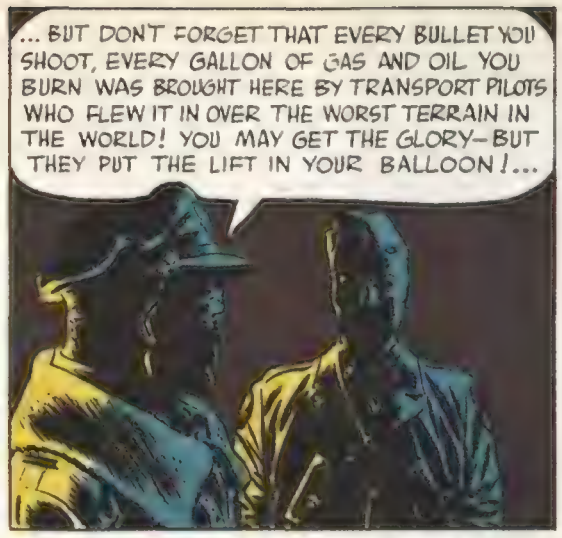
Hearst seemed to be obsessed with comics as a way to snatch away Pulitzer's readers. In October 1896 he

Bennett Daviss is a free-lance writer living in New England. He still misses his favorite, L'il Abner.

Prince Valiant earned creator Harold Foster renown for his elegance, fine detail and historical grandeur.

Innovative Frank King often divided one scene into panels for middle-class epic, *Gasoline Alley*.

WHY YOU USING LADDERS TO GET OVER THE FENCE WHEN THE GATE IS OPEN, SKEEZIX?
YOU WOULDN'T UNDERSTAND SISSY.
THIS IS FIRE DRILL.
WHAT DID YOU DO, AVERY, SELL THE OLD TOP OFF YOUR CAR?
I'LL BET HE MADE A DOGHOUSE OUT OF IT.
AND THAT NEW PUPPY OF WALT'S CAME OVER AND SCRATCHED UP HALF MY SPRING BULBS.
IF I WERE YOU, EMILY, I'D GIVE WALT A PIECE OF MY MIND.
BOTH WRONG. IT WAS GETTING SORT OF TACKY, ANYWAY AND I FIGURED MY BUS WOULD HAVE THE TRIM MODERN LINES WITHOUT IT.


... BUT DON'T FORGET THAT EVERY BULLET YOU SHOOT, EVERY GALLON OF GAS AND OIL YOU BURN WAS BROUGHT HERE BY TRANSPORT PILOTS WHO FLEW IT IN OVER THE WORST TERRAIN IN THE WORLD! YOU MAY GET THE GLORY—BUT THEY PUT THE LIFT IN YOUR BALLOON!...

Terry and the Pirates showed off Milton Caniff's cinematic flair.

Distortions were normal in McCay's *Little Nemo in Slumberland.*

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NORTHWEST

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LOOK TO US NORTHWEST AIRLINES

published what he promoted as the first full-color Sunday funnies section; in reality, the inside pages had only one color. A year later, Hearst detailed a staff artist named Rudolph Dirks to make up a new strip based on a series of illustrations Hearst had seen in Germany. The result was *Katzenjammer Kids* (German slang for "hangover," literally the "yowling of cats"). Dirks standardized the multipanel strip format and was among the earliest to use dialogue balloons. He was the first comic-strip creator to build stories around his characters, the plots of which never varied: Hans and Fritz, two jovial, maniacally destructive little boys, commit mayhem; then they're caught and punished. After years of bickering with his editor, Dirks left the *Journal* in a huff in 1912 and went to work for Pulitzer at the *World*. Following another round of legal squabbling, Dirks won the right to continue using his characters (under the title *The Captain and the Kids*), but Hearst retained ownership of the *Katzenjammer Kids* name. Both features ran in competition for more than six decades.

Convinced that the popularity of comics was the way to win over readers, Hearst soon launched a fleet of other strips destined to become classics. A staff member named Frederick Opper, regarded by many to be among the most inventive of strip artists, hatched *Happy Hooligan* in 1900. Hooligan was a sort of one-man Laurel and Hardy who could never avoid trouble, no matter how good his intentions. The same year, Opper added *Alphonse and Gaston*, peopled by two overly courteous Frenchmen who quickly gave their names to an American colloquialism. Outcault followed "The Yellow Kid" in 1902 with *Buster Brown*, starring a saccharine little boy whose tidy clothes and wide-eyed sincerity belied his hell-raising nature.

The artist who enchanted his readers and expanded the limits of the comic-strip form most significantly during those early years was Winsor McCay (see *Book*

In 1897, characters in "Hogan's Alley" went on tour, stopping in Germany for April 4 Sunday funnies panel.

It starred a night-shirted child named Mickey Dugan, also called the Yellow Kid (right) by a loving public.

The Yellow Kid was narrator for "Hogan's Alley"; his popularity forced most newspapers to carry comics.

reviews, p. 262). His *Little Nemo in Slumberland*, featuring a boy who had fantastic dreams inhabited by a bestiary of freakish creatures, offered a completely new concept. People changed size and shape from panel to panel (p. 183), walked on the ceiling and flew; there were labyrinthine cities and bizarre parades. McCay's inventive perspective turned the comic panel into vast, almost endless space, leading his characters through rococo landscapes. When McCay joined Hearst in 1911, he simply retitled his feature *In The Land of Wonderful Dreams.*

The best comic strip of them all

Between 1907 and 1910, another staff artist at the *Journal*, George Herriman, created a number of strips for Hearst. Along the bottom of one of them, *The Family Upstairs*, Herriman drew an inch-wide mini-strip where lived a cat and a mouse. The two exchanged witticisms for more than three years before going off on their own in *Krazy Kat*, perhaps the most highly praised strip of all time (p. 195).

The strip's plot was simple, its overtones cosmically complex. Ignatz Mouse had a single mission in life: "to Krease that Kat's bean with a brick," which he did daily. But Krazy loved Ignatz and took his brickbats as signs of love. Offisa B. Pupp, the local constable, was a mutt sweet on Krazy and he threw Ignatz into jail every time he completed his mission. The trio made up a good share of the population of Coconino County, an endless desert where strange flora and monolithic rocks would appear, change shape and vanish from frame to frame. Herriman gave his characters a unique, lyrical patois, a haunting and comically demented poetry that created a mystical and existential aura. Offisa Pupp might as easily have been talking about the strip itself when he said of Krazy, "His life is warped with fancy, woofed with dreams."

Predictably, this new style of comic wasn't a big hit with the fans. The feature survived because Hearst loved it and ordered his editors to use it. He acceded to their complaints only by moving the weekly strip to the arts and drama sections of the papers, where it acquired an almost cultlike following. (Devotees included poet e.e. cummings and President Woodrow Wilson, who hated to miss a single episode.) *Krazy Kat* was returned to its place in the Sunday funnies in 1935, where it stayed until Herriman's death in 1944.

Hearst often took a paternal interest in his comics and their creators, allowing only his cartoonists to go jacketless and wear their hats in the office. By 1924, he was paying his top cartoonist $2,000 a week. Arthur Brisbane, the *Journal*'s editor, didn't share Hearst's permissiveness toward the art department. Brisbane was once asked, "Would you consider a cartoonist a

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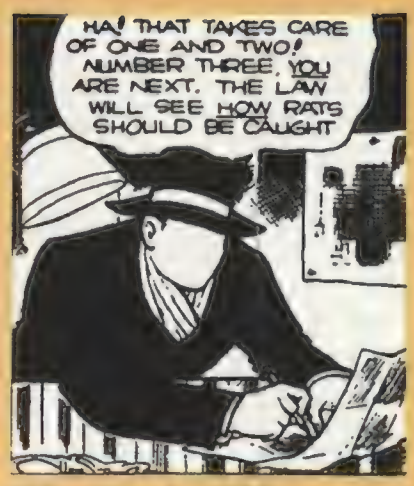
Larceny Lou, 1934

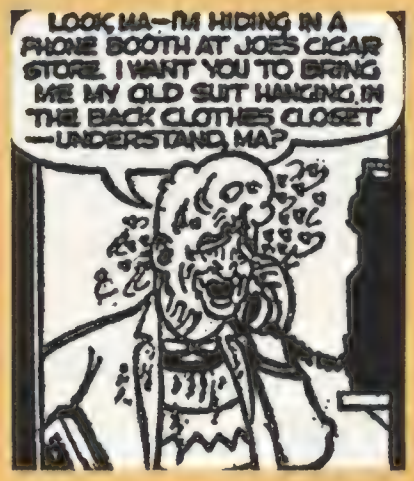


The Blank, 1937

Littleface, 1941

Flattop, 1943

Wormy, 1950


LOOK, MA—I'M HIDING IN A PHONE BOOTH AT JOE'S CIGAR STORE. I WANT YOU TO BRING ME MY OLD SUIT HANGING IN THE BACK CLOTHES CLOSET —UNDERSTAND, MA?

Flyface, 1959

Ugly Christine, 1965

Puckerpuss, 1976

Dick Tracy battled the motley medley of villains that have filled his rogues' gallery since 1931.

newspaperman?" The editor replied, "Would you consider a barnacle a ship?" One artist later recalled, "Hearst didn't care about money, all he cared about was beating Pulitzer."

The clear winners in the contest between Hearst and Pulitzer were the funnies fans. The 1920s gave rise to such all-time favorites as *Moon Mullins* and *Winnie Winkle*; and to two strips that have outlasted most others—attracting audiences that have followed them for decades—*Gasoline Alley* and *Barney Google*.

During the first years of Frank King's *Gasoline Alley* (p. 183), the story centered around a neighborhood gang of auto enthusiasts and backyard mechanics. But on Valentine's Day in 1921, when bachelor Walt Wallet discovered the foundling Skeezix on his doorstep, the course of the strip changed forever. Over the years, Skeezix went through school, fought in World War II and became a father and grandfather. It is the only long-running comic strip whose characters aged along with its readers, many of whom follow it as though it were a diary of their own lives and feelings.

Heebie-jeebies, hotsy totsy and horsefeathers

The title character of Billy DeBeck's *Barney Google* was always seeking the short path to easy money—and rarely finding it. DeBeck, revered not only for his graphic verve but for his flair for language as well, coined the phrases "heebie-jeebies," "hotsy totsy" and "horsefeathers." In 1934, Snuffy Smith and his band of hill folk joined the strip, which still appears in more than 800 papers, and eventually took it over.

Up until this time, most cartoonists had only skirted politics in their funnies. In the '30s, Harold Gray, with *Little Orphan Annie*, became more political than anyone had been before. The waif Annie was the ward of Oliver (Daddy) Warbucks, a beneficent war profiteer who served as chief mouthpiece for Gray's own conservative political views. Over the years, his characters railed against FDR and the New Deal, pegged labor union leaders as crooks and preached hard work and rugged individualism. But Gray's politics never interfered with his ability to tell a story. *Annie*'s characters radiated a depth and fullness not often matched in the comics, and Gray proved a master of plot, pace and emotional manipulation of his readers. Once, when the *Chicago Tribune* left out a daily episode, it was deluged by thousands of calls and telegrams and ran a front-page apology the next day.

The innovations and popularity of all these strips led to what is now regarded as the golden age of comics. During the 1930s and '40s, to the pleasure and delight of virtually every youngster and most adults, the realistic adventure strip was conceived.

Adventure comics had begun in earnest on Janu-

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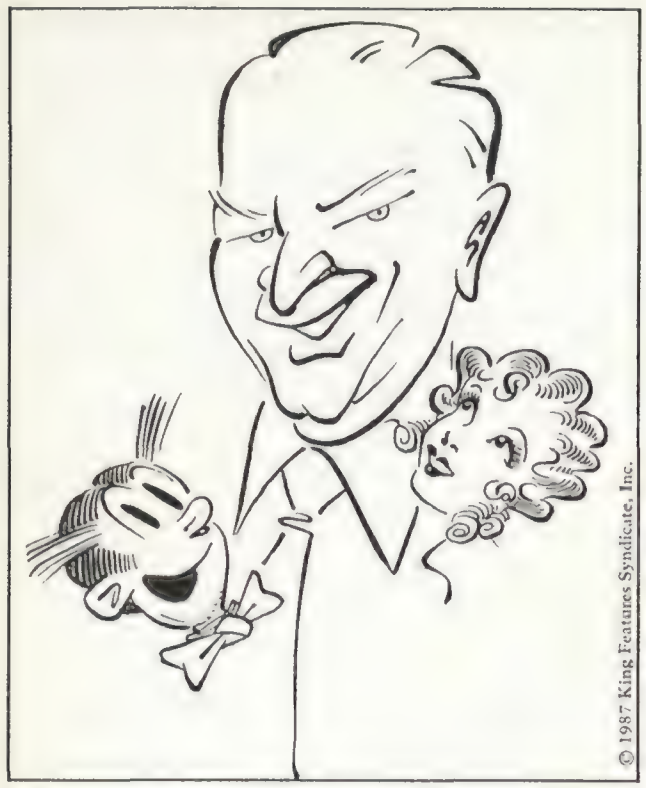
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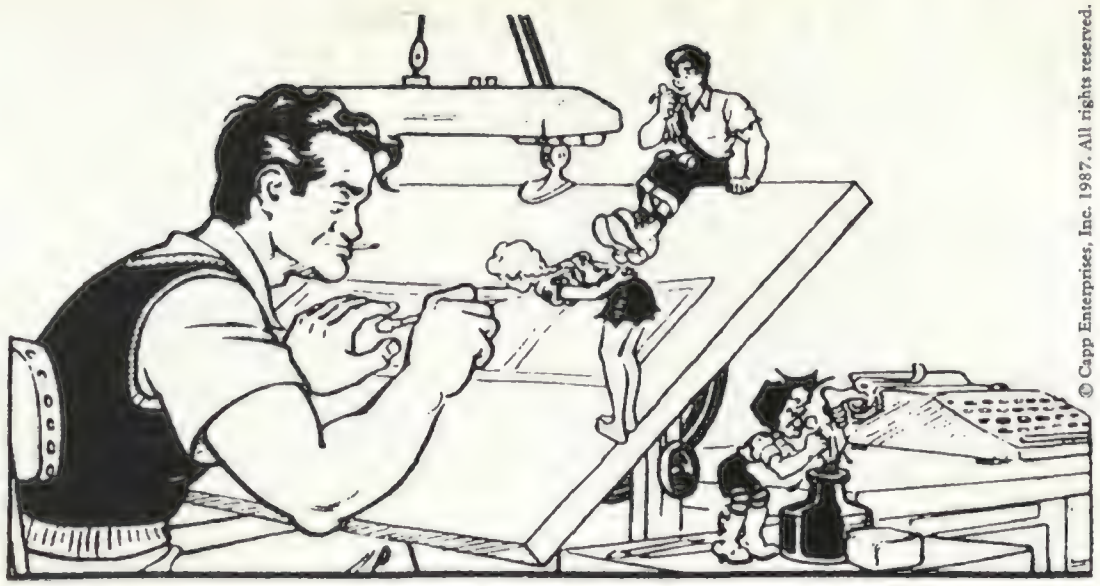
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Al Capp caricatured Al Capp with a little help from friends: innocent Li'l Abner, scrumptious Daisy Mae and wise old Mammy Yokum.

Chic Young caricatured Chic Young; his typical husband and wife, Dagwood and Blondie, were stars of world's most popular strip.

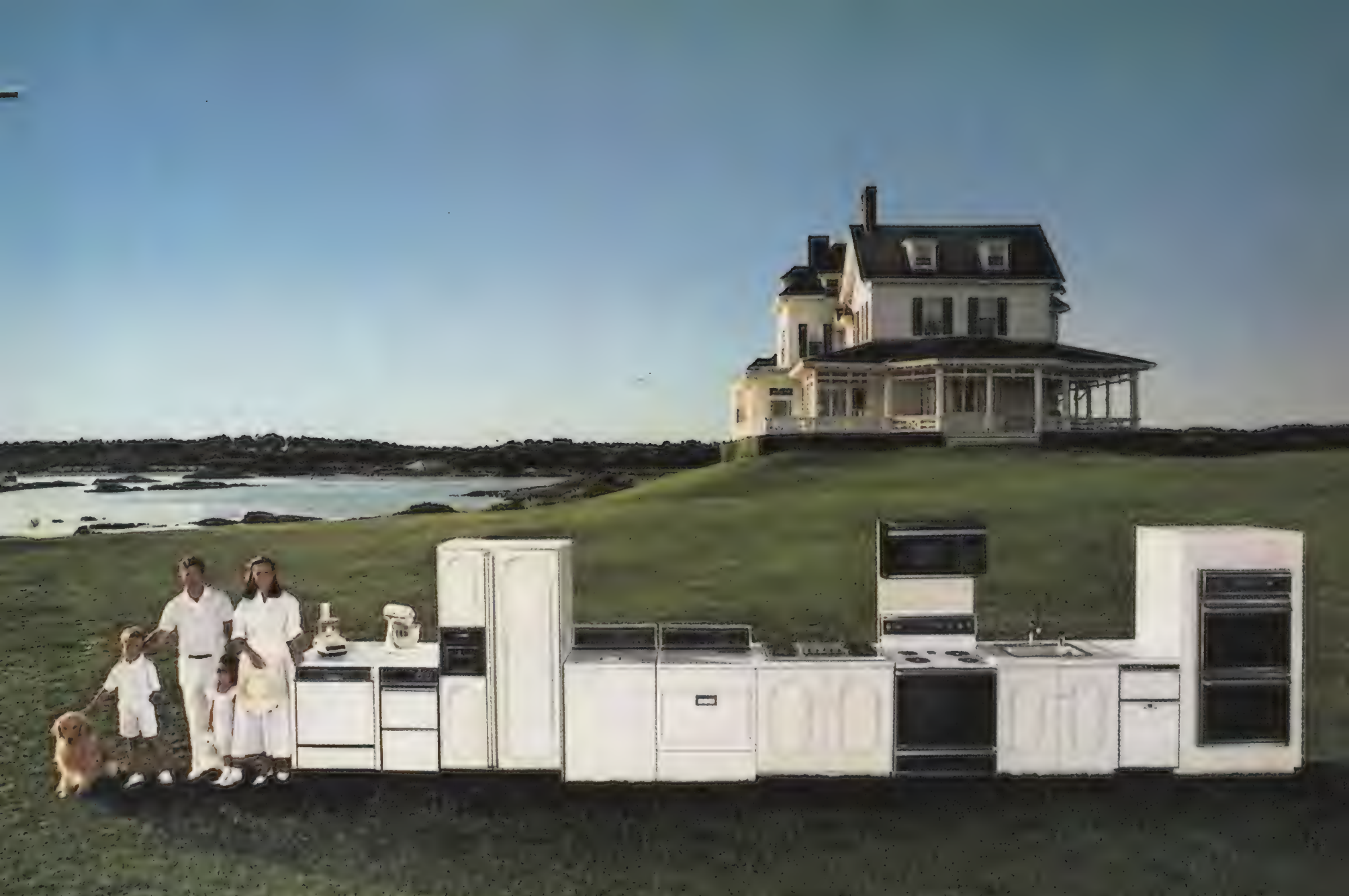
ary 7, 1929, with the birth of *Tarzan*, when United Features Syndicate hired a young illustrator named Harold Foster to draw 74 trial installments based on Edgar Rice Burroughs' 1914 novel. But not until 1937, when Foster created *Prince Valiant*, the Knights of the Round Table saga (p. 183), did an adventure strip truly seize an audience. Foster set a standard of excellence in his pen drawings, creating well-muscled heroes whose energy seemed, at times, to lift them off the page. Collectors treasure his work for melodrama that never quite breaks with credibility and for fine artistic detail.

In 1931, Chester Gould, who also considered reality to be only a starting point, conceived *Dick Tracy*. The strip remains to this day an American morality play, populated by symbols instead of people. It all started during its first week when young Tracy passed an evening with his sweetie, Tess Trueheart, and her father, a pleasant shopkeeper. A few days later, when Tess' dad was wantonly gunned down, the stunned and disillusioned Tracy set out to bring in the killers, dedicating his life to being the perfect detective. He vowed to fight evil wherever he could find it. Gould's message never changed over the years: danger and violent death can befall any of us at any time, and only men like the unsmiling, square-jawed Tracy can keep chaos at bay. Tracy's grim obsessiveness was matched in intensity by the repulsiveness of his foes. Gould's gallery of malefactors—Puckerpuss, Wormy, Flattop, Flyface—all sported visages to match their monikers, making them seem monsterlike and fundamentally inhuman (p. 188).

By now the comics were covering good and evil, cops and villains, family life and Crusades. If all this sounds a little serious and weighty, then clearly the time had come for a burlesque show. And never was it more delightfully done in the funnies than by Alfred Caplin, who cartooned his way to fame as Al Capp (above). His Abner Yokum was a hill-country lad of abject simplicity and a paragon of human decency. In *Li'l Abner*, Capp used him as a sort of unwitting Socrates to skewer every foible, politician and trendy notion of post-1920s America. Abner's faith in justice and truth was sustained by his own favorite comic strip, "Fearless Fosdick." The title character, a plain-clothes detective who looked like Dick Tracy's older brother, was an overzealous blunderer who shot first—usually at the wrong people—and asked questions never. But Abner, who knew that Fosdick's heart was pure, regularly declared him the "ideel of every red-blooded American boy."

Abner and his adoring girlfriend, the well-endowed Daisy Mae Scragg, may have been the two most normal people living in Capp's backwoods community of Dogpatch. Hairless Joe and Lonesome Polecat spent their lives brewing Kickapoo Joy Juice in their cave. Joe Btfsplk, a hillbilly schlemiel, carried his personal raincloud overhead. Power belonged to politicians such as Senator Jack S. Phogbound and Henry Cabbage Cod, or to assorted magnates like General Bullmoose and J. Roaringham Fatback, the hog tycoon.

Dogpatch was periodically infested by Shmoos and Kigmies. Shmoos laid bottled, grade-A milk and fresh, packaged eggs. Fried, they tasted like chicken; broiled, like steak—and they jumped, smiling with delight, into a frying pan every time they saw a hungry human. "It's the worst tragedy ever to hit hoomanity!" bawled one Dogpatch denizen. "Bein' overwhelmed by pure, unadulterated goodness!" When Schmoos weren't wrecking the economy, Kigmies were jeopardizing politics.



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WHY MUST WE BE ENEMIES?
ONE REASON MIGHT BE THAT THE LAST TIME I SAW YOU, YOU TRIED TO HIRE A GUY TO KILL ME!
I KNOW--- AND I'M SORRY! I WAS ANGRY---I DIDN'T REALLY MEAN IT!
HOOEY!

Dashiell Hammett created characters for *Secret Agent X-9* drawn by *Flash Gordon*'s Alex Raymond.

BUT IT'S NOT HOOEY---LISTEN TO ME, DEXTER, YOU'RE AN ATTRACTIVE MAN---AND STRONG AND VIOLENT---AND I'M AN ATTRACTIVE AND STRONG AND VIOLENT WOMAN--- WHY SHOULDN'T WE-------
WHAT IS THIS----- AN HONORABLE PROPOSAL OF MATRIMONY?
I CAN HELP YOU--- I CAN LEAD YOU TO THE TOP"
WHERE IS HE?
7-24
ALEX RAYMOND

The strip was conceived by King Features in 1934 in an effort to knock off the ever-successful *Dick Tracy*.

They loved to be kicked, providing a ready release for human aggression and thus fomenting world peace. Capp's satiric skill has ranked him in critical esteem with Mark Twain and Jonathan Swift.

There was one time when Capp described a relatively unknown artist's work as "so superior to mine that I shudder to think of it." That young artist was Milton Caniff, who at 80 is still drawing his classic *Steve Canyon*, now in its 40th year. He is regarded as the preeminent illustrator and innovator in adventure comics. In *Terry and the Pirates*, Caniff evolved a graphic style that relied on brushwork more than the pen, creating a kind of stark visual lushness by using the interplay of light and shadow. It was a spinoff of the cinematic technique he picked up as a longtime movie addict. Caniff developed the use of close-ups, long shots and striking visual angles to make a dramatic point and rivet the attention of his reader. "He knew how to let shadows tell a story, and that—combined with his use of 'camera angles'—translated into photographic realism," Marschall explains. "It was a new way of drawing—many cartoonists copied it."

Terry and the Pirates was more than a comic strip to its readers. It offered them a personalized look at current news as Terry matured into a young military commando involved in the events that led to war in the Pacific. The strip's Air Force pilots flew the Hump from India to China during the early 1940s to resupply Chinese troops fighting Japan (p. 183). During the war, the public was skittish about the use of blood plasma; Caniff's characters reassured people by saving lives with it.

In a 1981 *Comics Journal* tribute to Caniff, critic R. C. Harvey wrote, "Our fanciful longing for adventure was satisfied in terms so real as to convince us that such adventures were possible—that they had even actually occurred." And that, after all, was what adventure comics were all about.

But not everything that came into the comics pages during their golden age was from the world of fantasy and adventure. One feature, begun by Chic Young (p. 190) in 1930, looked in on a cocky playboy and his leggy blond girlfriend who said "tee hee hee" a lot. Within three years the playboy image was gone and Dagwood was disinherited by his parents when he disobeyed them to marry Blondie. The two settled into what became the world's most widely syndicated strip until *Peanuts* surpassed it in the 1970s. *Blondie*, which still appears daily in more than 2,000 newspapers, "is a fine, old-fashioned picture of modern domesticity with all the colors, except those of disillusion and boredom," one reviewer wrote. "It's Utopia in the suburbs." But historian Berger sees the strip's mass appeal as a sign of something deeper and more disturbing. "Readers can see beneath the humor and recognize their own patterns of behavior being acted out." The Depression seriously eroded public confidence in the "can-do" businessman and, Berger adds, "Dagwood is . . . an irrelevant male and feeling it, but not knowing it. It is a tragedy of the most profound dimensions."

The comics evoke as many emotional responses as there are readers that follow them. Most of us find the funnies a welcome diversion from our daily lives, while scholars analyze them as a commentary on American society, and the most ardent fans collect and preserve them. But one thing is certain—they've become a medium that finds itself less and less relevant to our existence and doesn't quite know what to do about it. According to Richard Marschall, "Almost every factor you can name is conspiring to cheapen the comics—to make them less attractive, less exciting."

The chief factors are economic. Comics live in newspapers, and dozens of them have gone out of business. The comics that are left are squeezed into smaller spaces; weekday comics have lost an inch or more of width since the 1960s.

That inch was critical. Losing it meant the death of the best adventure strips, which had already been weakened by editors' reluctance to show the graphic violence and overt sensuality of the genre. Serial strips

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depend on complex plots and detailed art, and need every bit of space. When papers shrank their width, strips like *On Stage* and *Buck Rogers* no longer had room to spin their tales. *Spiderman, The Phantom* and a few other adventure strips endure, but with simpler plots and art. "Joke-a-day" strips such as *Garfield* and *Beetle Bailey* fare better, but also suffer.

Laments Bill Watterson, whose *Calvin and Hobbes* is carried by more than 400 papers, "We've seen the traditional four-frame comic give way to three frames or even two. Cartoonists are trying to keep their strips from looking cluttered. Comics like *Doonesbury* or *Cathy* that have a lot of dialogue demand diligence from readers. As a result, a lot of artists try to get by on very simple gags and equally simple drawings. When you have ten words and two frames, you just have to set up the gag and deliver it, ba-boom."

Watterson points to Walt Kelly's *Pogo*, which ran from 1948 to 1975. "That strip had a lot to do with my interest in becoming a cartoonist," he says. "It was set in the Okefenokee Swamp, which Kelly made into a rich visual locale. The characters spoke with a kind of poetic, backwoods elegance; one character, Deacon Mushrat, always spoke in Old English typeface. Today, there simply would not be enough room for it."

Cartoonist Jerry Robinson wrote in his book *The Comics*, "It is doubtful that 'The Yellow Kid' and *Little Nemo* would have made the impact they did if they had been restricted to today's sizes."

The newspapers' financial squeeze has also pinched the syndicates. As the papers failed, syndicate revenues decreased, making them more dependent on the income from the merchandising of cartoon characters. *Peanuts* was the first to go commercial in a big way, spinning off dolls, greeting cards and enough other products to create its own sizable industry. *Garfield, Cathy* and other strips have followed. According to Watterson, "If a syndicate is trying to decide between two new strips, there's a tendency to go with a weaker feature that has licensing possibilities over a better comic that doesn't." While such arrangements allow some strips to survive, "it deprives the reader of a diversity that the comic pages should have."

As a result of these economic factors, the comics are losing their richness of story and characters at a time when the funnies are already having trouble luring their readers away from television. Clearly, it's a difficult challenge—perhaps insurmountable. "It's hard to see what kind of a future comic strips could have, the way they're going now," says Donald Phelps, an influential comics commentator for *Nemo*. "The present tone is so moribund, so vapid. Even comics that have been among the most stylistically influential seem dried out, tired, scrambling after terribly paltry gags." Marschall thinks the trend is hardest on what he calls "second tier" strips. "Every paper that has a chance will run *Garfield, Peanuts, Blondie, B.C., Doonesbury* —the headliners," he explains. "There won't be much room left for the other 80 or 90 strips out there—things like *Krazy Kat* or *Polly and Her Pals*, strips that weren't for everyone, but thrived for years with their own quiet followings."

Some observers hope that newspapers will realize what Hearst and Pulitzer knew years ago—that comics can offer a depth and richness of entertainment that readers will eagerly pay for—and restore the strips to their rightful size and prominence. No one is ready to eulogize the American comic strip. There will always be a place for the funnies. Collectively, they're us.

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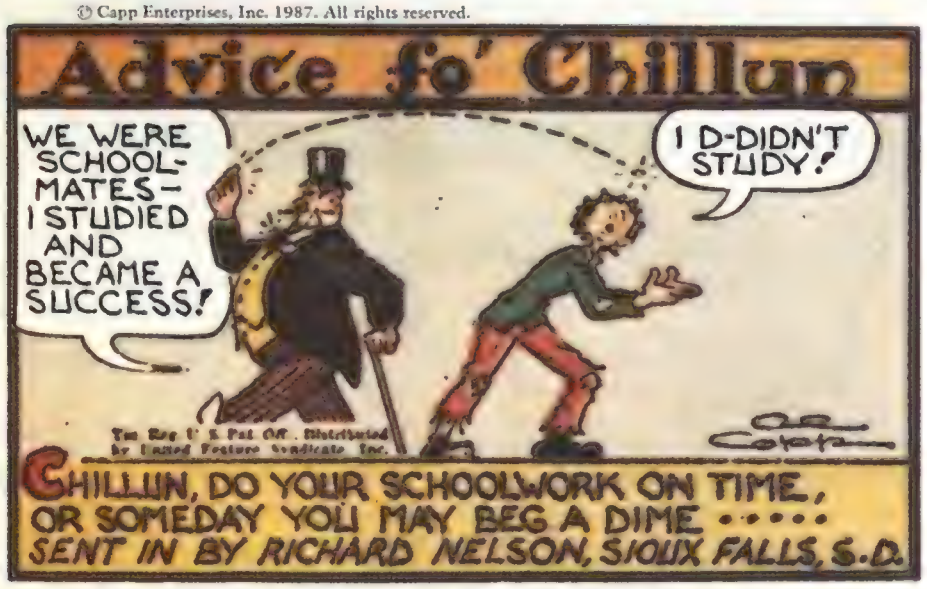
Advice fo' Chillun
WE WERE SCHOOL-MATES— I STUDIED AND BECAME A SUCCESS!
I D-DIDN'T STUDY!
CHILLUN, DO YOUR SCHOOLWORK ON TIME, OR SOMEDAY YOU MAY BEG A DIME .....
SENT IN BY RICHARD NELSON, SIOUX FALLS, S.D.

Al Capp created graphic fillers for Sunday editions to communicate with readers and please local editors.

Widely considered best comic ever drawn, *Krazy Kat* gave readers sophisticated style but remained nutty.

" KRAZY KAT. "
Registered U. S. Patent Office
" JAIL. "
HEPPI BOID DAY TO YOU — HEPPI BOID DAY TO YOU-U-U
" BE YOU EVER SO FORGOTTEN " THERE'S SOMEONE WHO REMEMBERS ".
HERRIMAN

Trenches near Beaumont-Hamel, once churned up by shellfire, have been softened by time and weather.

By James D. Atwater

Echoes and voices summoned from a half-hour in hell

At the Somme in July 1916, brave men of the Newfoundland regiment were senselessly ordered forward to all but certain death

Astonishingly, there is no one there. The billows of land roll on to the horizon, gentle shades of green blending into far-off blue. There must be some mistake. You are alone in a part of the world that you had always imagined as being filled with masses of men waiting for their moment in history—7:30 A.M. on Saturday, July 1, 1916—and the order to begin the Battle of the Somme.

And something else is wrong. There is no noise. Somehow you had assumed there would always be noise, a lingering rumble, at least, of the tornado of sound that swept across these fields more than 70 years ago, shaking the soul of everyone who heard it, clamping down like a magnet until it became part of everyone and everything, the men and the landscape.

To get to Beaumont-Hamel, where the Newfoundlanders fought, you leave the main road and veer off to the left, studying the map carefully. Only then do you begin to notice what at first seem to be tiny, enclosed parks set down beside the main road or incongruously placed in the middle of a farmer's field, a single-track dirt road leading up to a wooden gate.

The small patch of earth Newfoundlanders fought for is marked by a bronze caribou, the island's emblem.

They are the cemeteries for the British Army dead, men from England and Scotland and Wales and Australia and the other parts of the empire who died here during the Great War. The effect is not as overwhelming as it sometimes is in the far larger cemeteries of Normandy that commemorate the Americans who were killed a quarter-century later, and at places near Château-Thierry and Verdun, but if the impact is less dramatic it is perhaps more insistent. Men died here, lots of them, and here, and here, and here.

On the Newfoundlanders' field of battle the old trenches can still be seen. Smoothed and softened by time, they lie like a gentle range of miniature mountains and valleys. They are grassed over, but narrow; sandy paths wind along the bottoms of the trenches. In the intervening years, enough people have felt compelled to stand where the men had been to wear away the turf. A crag of rocks and bushes rises steeply ahead, topped by a great, dark, metal statue of a caribou (above), the symbol of the Royal Newfoundland Regiment. His magnificent antlers are lifted high. He is looking out toward the German lines.

What drew me to the Newfoundlanders was a kind of terrible fascination with what had happened to their regiment on the Somme. Even in a war of senseless bloodletting, few units, if any, lost so many men in such a short period of time for so little gain. What happened to the Newfoundlanders summed up what happened to the British Army on July 1, 1916, the bloodiest day in its long history, the bloodiest of any army in World War I. Some 57,000 men, about half of those who attacked, were killed, wounded or captured —30,000 of them in the first hour alone. Fighting defensively, firing their Maxim machine guns with deadly accuracy, the Germans suffered only 8,000 casualties. On that disastrous day 790 men of the Newfoundland regiment climbed out of their trenches and, laden with equipment, began to walk toward the German lines. In just over a half-hour, 272 men were dead or mortally wounded. More than 400 of them were hit but survived. The Newfoundland regiment had virtually vanished. Not a yard of territory was taken. Later, talking to survivors, I could find no one who had even got off a single shot.

Minutes before zero hour on July 1, 1916, British troops near Beaumont-Hamel (left) wait to go into battle. Then, just before they had to go over the top, tons of explosives blew up (above), hurling earth high into the air—and alerting the Germans.

The day and the tactics, the loss of so much life for so little, the stubborn sending out of men, unit after unit, to die uselessly, was the responsibility of Sir Douglas Haig, commander of the British Expeditionary Force in France. He felt predestined to win a victory so glorious that it could finish the war. Before the battle, Haig wrote to his wife: "You must know that I feel that every step in my plan has been taken with the Divine help."

Haig's plan, which offered some hope of ending the bloody stalemate of trench warfare, was intended to relieve pressure on Verdun (see map, p. 202), where the Germans were inflicting heavy casualties on the French. First the Germans would be shelled with the heaviest bombardment ever—the rumble was clearly heard on the English coast 135 miles to the west. Then infantry were to punch a hole through the German lines. Next, Haig intended to deploy three cavalry regiments to exploit the opening, very much in the way that German tanks would exploit the breakthrough at Sedan in 1940 (SMITHSONIAN, February 1986).

But the Germans survived the seven-day bombardment and, on the bright, hot morning of July 1, saw, disbelievingly, one of the most astonishing sights of the war. Because most of their troops were inexperienced, the British commanders had sent them out in lines, at a steady pace, bayonets held high, so that they would not get disorganized. After watching the scene, poet Siegfried Sassoon wrote in his diary: "The sunlight flashes on bayonets as the tiny figures move quietly forward.... I am staring at a sunlit picture of Hell."

The tragedy of the day changed the idea of war forever, not only for the British, but for the rest of the world. "Idealism," wrote historian A. J. P. Taylor, "perished on the Somme." A cadre of young British poets serving in the line began to write verses about the damnation of Man by war that described the true horror of the trenches. "What passing-bells for these who die as cattle?" Wilfred Owen would ask in *Anthem for Doomed Youth*, answering, "Only the monstrous anger of the guns."

Haig kept up the pressure on the Germans for four months until, in November, the Allies finally "won," gaining an area about 25 miles long

and 7 miles wide. The British lost 419,654 men, either killed, wounded or captured; the French, 204,253; the Germans, about half a million.

In 1918, when Germany launched a last, desperate offensive and part of the British Army nearly broke, German soldiers retook the Somme, only to lose it again in a weekend when the British rallied, beginning the counterattack that would end the war.

The Somme—and Verdun—turned the battlefields of World War I into a charnel house that the British did not forget. During World War II, when Gen. George C. Marshall (and the Russians) pressed for an invasion of Europe sooner than England wanted, Lord Cherwell, a onetime aide to Winston Churchill, explained his country's hesitation. "It's no use," he remarked. "You are arguing against . . . the Somme."

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Sixty seconds after the attack began, a ragged line of soldiers advances across open ground toward barbed wire and enemy machine-gun nests. In the trench behind them, a second wave of men waits to join the battle.

I went to Saint John's, Newfoundland, to talk to some of the survivors of July 1, 1916, to hear what they remembered, to learn what I could about the road they had traveled to the Somme and why they did not break and run. The blood had flowed in such gouts, one man recalled, the field smelled "like a slaughterhouse."

When the war began in August 1914, there was no military unit in Newfoundland, not even a band of overage reservists to use as a cadre. There were no uniforms, nothing, and there was little chance of getting any help from across the Atlantic. To mobilize for war, the city of Saint John's created the Patriotic Association of Newfoundland. The leadership of the association was carefully selected to represent the three-way split in religion in the colony: Church of England, Methodist and Catholic. Newfoundland promised Britain it would recruit, train and equip a volunteer fighting force of 500 men and would raise all the money itself.

Newfoundland's population was about 250,000 in 1914. It is only 580,700 today. The island had no soldiers, but it had boys and young men who had some quasi-military training in special units organized by the city's large and active churches. Groups like the Anglican "Church Lads' Brigade," besides fostering leadership and developing character, taught parade-ground drill and marksmanship.

On the first night of enlistments, Sid Frost, a young accountant, was part of the crowd jammed into the C.L.B. Armory. When I talked to him, he still vividly remembered the surge of excitement, the shouts back and forth between friends, and the fact that Leonard Stick, one of his buddies, managed to duck around some of the screening procedures to capture the honor of being the first man to join the Newfoundland Regiment. (Stick was to win a battlefield commission during the first day of the Somme.) Within a week, 275 were on the rolls and every person who enlisted seems to have remembered his number. It was a badge of honor. Every man I talked to in Saint John's proudly and promptly recited his for me. Sid Frost's was 58.

He was 22 when he enlisted, but many were younger than the minimum of 19 set by the Patriotic Association. John Ryan was 17. No matter; he lied about his age and began earning $1 a day as a private, far less, however, than he could have expected to get around the docks of Saint John's. To appear older than his 15 years, Walter Day went down to the brigade hall wearing a black shirt and Australian-type slouch hat, and got in with no trouble at all.

The recruiters and doctors examining the recruits surely must have known most of the boys in town and could have told who was underage and who was not. There must have been a kind of quiet conspiracy, one joined in by the parents of the un-

The author, a former senior editor of Time, *is Dean of the University of Missouri School of Journalism.*

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derage boys to allow them to get in on the great adventure. And some parents with initial misgivings were brought around. George Chalker was just 15 and weighed only 112 pounds, and they took him, or at least they did until his father came down and dragged him home. A few months later, his father relented and young Chalker went off to war, afraid, like all the others, that the whole show would be over before he got a chance to kill some Germans.

With the whole populace apparently pitching in, the Patriotic Association rapidly created a training camp at nearby Pleasantville, so close to town that relatives and friends could walk over after supper to see their soldiers in the making.

The boys' brigades contributed 47 tents to the encampment and Governor Sir Walter E. Davidson sent over three marquees used on ceremonial occasions at Government House, his official residence. Three local firms—Reid Newfoundland, Bowring Bros. Ltd. and Newfoundland Produce Co. —offered to give free transportation to anyone who volunteered from the seaports up the coast, who had to travel by sea to get to Saint John's. Mr. J. Clouston offered to donate four cooking ranges. Mr. K. R. Prowse said that the new battalion could use the old golf links "for any purpose for which it may be required."

Map of Somme area shows situation on Western Front (red) at time of battle.

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Before Newfoundlanders had been issued uniforms they were hastily introduced to the mysteries of this Colt-Browning machine gun.

Since no suitable khaki material was available in Saint John's for the first 500 men recruited, the association authorized the making of puttees from fabric that was navy blue. The resulting wrappings, used to bind a man's pants between knee and ankle, became a symbol of great prestige. To have been a member of the "First Five Hundred," as Col. Gerald W. L. Nicholson noted in the *Fighting Newfoundlander*, the official history of the regiment, was to be known forevermore as a "Blue Puttee."

Initially, Newfoundland's bankers and merchants and civic leaders calculated it would cost $520,000 to raise, equip and keep the original 500 in the field for a year. All through the first year, the association raised money as best it could. One event that occurred on October 1, 1914, especially conveys the spirit of what it was like to live in Saint John's at the time. It was a show put on at the Casino Theater by the Women's Patriotic Association and, as described by the *Daily News*, it caused "a spontaneous outburst of patriotic ardour and enthusiasm. Even the staidest, caught up by the inspiration of the moment, let themselves loose and joined heartily in the national songs."

Part of the show was composed of a series of tableaux, the curtain opening to reveal local residents posed motionless, more or less, as they tried to depict such motifs and sentiments as "The Hero of the Hour," "The Triple Entente" and "The British Empire." The most popular scene, entitled "The Widow's Mite," showed a widow offering her two sons to Britannia. Mr. Goodridge sang "Tommy Atkins" and "Soldiers of the King" and Miss Mare sang "All the Nice Girls Love a Sailor." Then Miss Louise Anderson sang "It's a Long Way to Tipperary," changing the last lines to "Good-bye, dear old Narrows,/ Farewell Pleasantville,/ It's a long long way to Terra Nova,/ But my heart's right there." Terra Nova, of course, was Newfoundland, and the narrows was the opening of the harbor that led to the North Atlantic and the fields of France.

Thousands went out to Pleasant-

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ville to watch the departure of the men, or to march along with them down to the harbor. Thousands more, many thousands—the biggest crowd in the history of Saint John's until that time—lined the streets and climbed poles and roofs along the route. More than 400 of the 526 men and officers had been born and raised in Saint John's; they not only were hometown boys, they represented the very best in the community. The war had a face and it was a familiar one. Sid Frost was one of the few who did not have a retinue of friends and relatives. As he strode along, a boy of about 8 came up to him and asked, "You don't have anyone?" Frost said no. The boy asked if he could carry Frost's bag, and the two marched along together down Water Street by the harbor.

The buildings were bright with flags and decorations, and so were the ships in the harbor. The church brigades' bands played as each company was lined up and marched onto the S.S. *Florizel*, a passenger-freighter used in the spring to haul seals slaughtered on the ice to the north.

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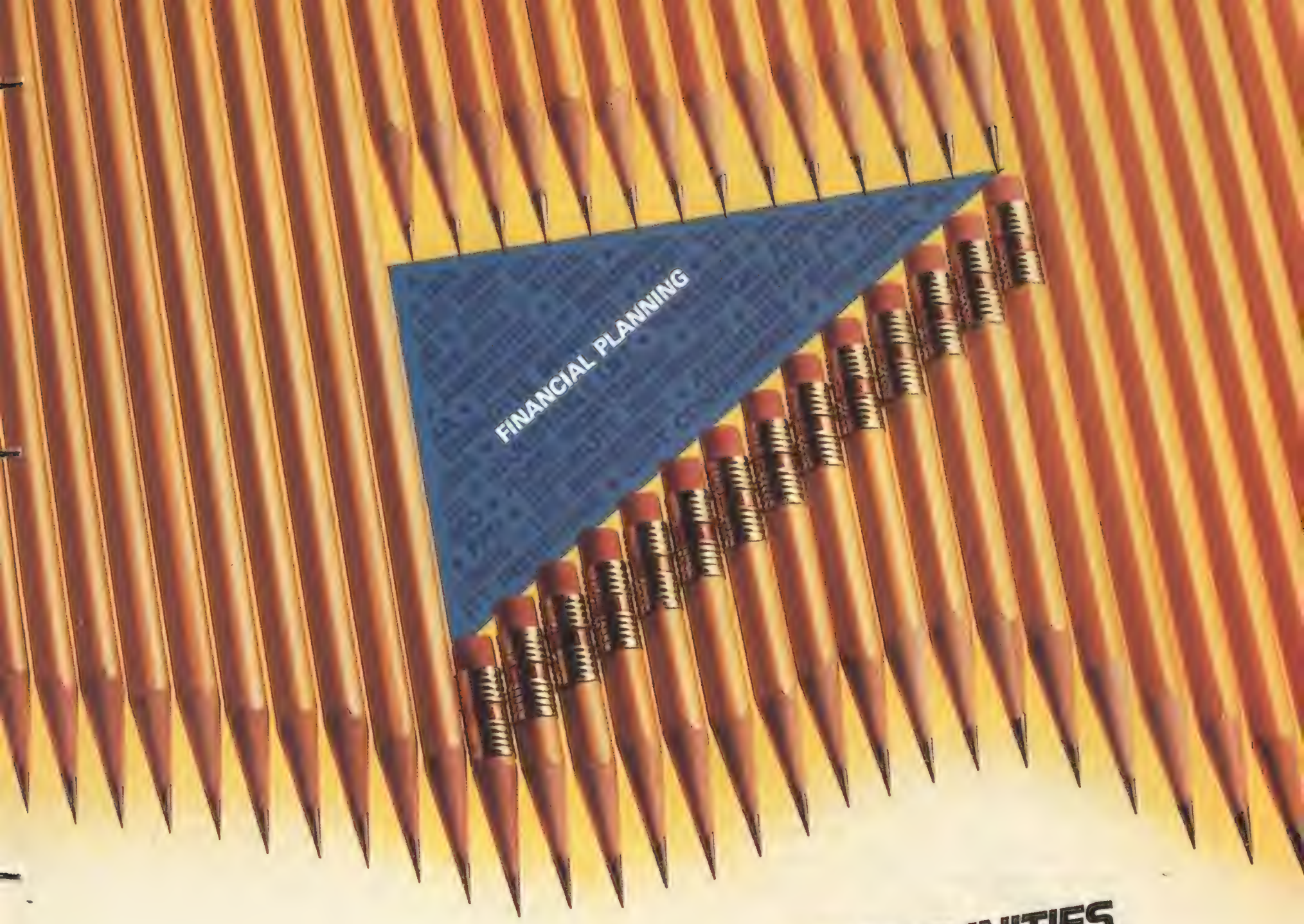

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Capt. James Ledingham, third from left, though wounded at the Somme, fought again and was killed in October 1917.

The men would later recall that the holds still smelled faintly of seals. On board they began to sing "Tipperary." Their voices were joined by those of the thousands on shore, and the sad, homesick song of the British Army filled the harbor. Standing on deck, Frost caught sight of the boy who had carried his kit. He was waving from the dock. After the war, Frost was to meet the boy again and learn that the youngster had known no one else that day to say good-bye to. Their needs had matched perfectly.

The next evening, the *Florizel* steamed off through the narrows to join a convoy. She was accompanied past the headlands by boats and launches, and cheers followed faintly in her wake as she finally pulled away.

The route to the Somme was long and wandering. After serving guard duty in Scotland, the Newfoundlanders were blooded in the ill-fated landings at Gallipoli and later posted to Egypt. In Gallipoli they got a new commanding officer, Lt. Col. A. L. Hadow, an Englishman who before the war had served with small units in the distant reaches of the southern Sudan.

None of the men I spoke to remembered Hadow with affection, but they all recalled him with respect. He was a demanding man. One evening he sent the battalion on a 14-mile march into the desert. A total of 76 men fell out and the ordeal so enraged some of them that they shouted at him in derision. Somehow they got away with it. Under his stern command, the regiment began to regain its strength, after the hardship endured in Gallipoli, and to develop a new sense of confidence. Frost remembered that the men began to sing a song that seems insulting when the words are isolated on paper, but were admiring when bellowed out on a march:

> I'm Hadow, some lad-o
> Just off the staff,
> I command the Newfoundlanders
> And they know it—not half.
> I'll make them or break them,
> I'll make the blighters sweat,
> For I'm Hadow, some lad-o
> I'll be general yet.

Sixty-two years later, Frost—who had been a banker in Saint John's—raised a voice that was husky but still strong and boomed out the refrain for me, remembering every word. He was smiling as he sang.

Finally France, the troopship pull-

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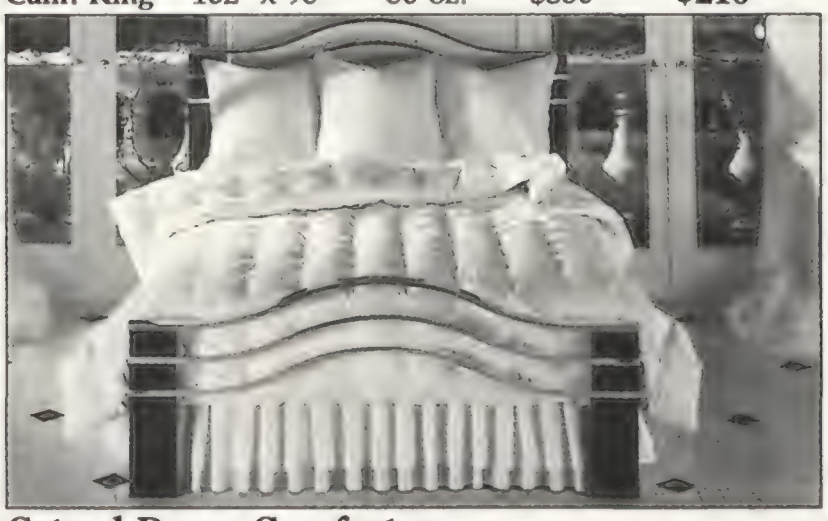

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ing into Marseilles, then a jolting ride up the Rhône Valley through Lyons, a detour around Paris and, at last, a small town in the northeast, out of earshot of the rumble of guns, called Pont-Remy. General Nicholson records that the men who climbed down from the railroad cars to fall in and march across a bridge paid little attention to the river moving slowly below. It was the Somme.

At 9 P.M. on June 30, the regiment assembled on its parade ground: 25 officers, 776 privates and noncommissioned officers. The Newfoundlanders were not to take part in the initial attack, but to have the honor of participating in the coup de grace that would carry the day—taking the third line of German fortifications. Captain Frost was assigned a man with a can of white paint and a brush. They were to go out onto the battlefield after the Germans had been routed and paint the name of their unit on the captured guns so no one else would get credit for taking them.

As villagers watched, the troops swung into place and the familiar parade ground sounds—so haunting at every staging area in the world—echoed across the evening fields: the cry of voices raised in command, the slap of hands on rifle stocks, the crisp thump of rifle butts slammed to the ground. When all was ready, Colonel Hadow rode up on his charger, waved his hand and the Newfoundlanders set out for Beaumont-Hamel.

It was cold that night, John Ryan remembered, cold and still as the men marched toward the lines for five hours. Ryan recalled swearing in front of a chaplain and being royally chewed out. The men hunkered down in groups in the bays of the trenches. Even then the platoons were breaking up into clusters of individuals as the isolation of battle started.

At dawn, the trenches slowly came alive. Curiously, no one I talked to could remember whether or not the battalion was served the customary tot of rum before the battle, a clout of a drink that in other regiments made a few inexperienced young soldiers so drunk they passed out. The Newfoundlanders followed the sol-

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diers' ritual of checking their equipment. In addition to his rifle, each man carried 170 rounds of ammunition, rations, two empty sandbags, two Mills grenades, a helmet, a water bottle, a field-dressing kit and a waterproof sheet. Everyone also had to carry a share of the regiment's heavy gear needed to take and hold ground: wirecutters, stakes, picks, shovels and sledgehammers. Some men hauled parts of 32 bridges specially built to help the unit cross over the German trenches. Each man in the attacking infantry wore on his back a triangular piece of metal designed to reflect the sun and show observers watching with binoculars from the rear how well the advance was going.

In all, like the 60,000 other soldiers up and down 18 miles of front, each Newfoundlander would tote upward of 66 pounds of equipment into the battle that the brigade commander assured would be a "great victory" and probably the "beginning of the end of the war."

At 6:25 A.M., the final artillery bombardment began—the shells roaring over the Newfoundlanders' trench, raising morale even higher. Everyone imagined the havoc being wrought in the German lines. The men had nothing to do but wait until their moment of attack, set for 8:40. The first wave was to go at 7:30.

At 7:20 there was a tremendous explosion off to the left (pp. 198-99). Walter Day remembers peering over the top of his trench and seeing a mountain of earth rising into the sky and holding there for an instant before beginning to tumble to the ground. At first he thought that the blast had magically lifted the entire village of Beaumont-Hamel into the air. The explosion was caused by 40,000 pounds of ammonal that had been packed into a tunnel under the German fortification that commanded the terrain the Newfoundlanders were supposed to cross. The blast was intended to destroy the fortification, but because the British chose

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to blow the mine before zero hour what it also did was alert the Germans that an attack was imminent.

When the mine exploded, Ryan could not believe the Germans had been given such a clear warning. "That's it," he thought as he watched the earth fall. "We're licked."

"Within five minutes," the official British history notes, "it seemed that every enemy machine gun along the front was firing incessantly. The divisions were caught forming up." A German regimental historian later wrote: "Ahead of us, wave after wave of British troops were crawling out of their trenches and coming towards us at a walk, their bayonets glistening in the sun."

Sometime that morning, John Ryan learned just how badly the assault was going. With no warning, a British officer rolled into the Newfoundlanders' trench. Ryan never did learn what regiment he came from, but it made no difference. He clearly recalled the man gasping, "They've wiped out all of us."

As the Newfoundlanders waited, other units of the 29th Division struggled out of the trenches, adjusted their heavy loads and started their walk to destruction. Machine guns in the valley around Beaumont-Hamel swept the field. German artillery, 66 batteries in all, including 11 hidden until the attack, rained shells on the advancing British. The German barbed wire turned out to be uncut by the seven-day bombardment. Whole battalions were swept away. The Second South Wales Borderers went into action at 7:30 in the first wave. "Within five minutes," the official history notes, "nothing remained of [the Borderers] but a few scattered individuals lying within 100 yards of the German trench."

By about 8:15 A.M., any man who stole a glimpse of the battlefield knew that the attack was a horrendous blunder, but the generals were not so sure. There were, to be fair, confusing signals coming from a distant

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Young Newfoundlanders cheerfully lounge for informal portrait on troopship. Trip took 16 days from Saint John's to Plymouth.

corner behind the front lines along a lane known as Station Road. Trying to make what they could out of the confusion that morning, observers spotted flares rising into the sky from the area, the agreed-upon signal to indicate that the position had been captured.

The message went against all logic and all the evidence before the generals. The 29th Division clearly was being slashed to pieces. As it turned out, the flares actually were German signals to their own artillery. But, records the official history of the division, "when the military machine gets in motion, it is hard to divert or stop. Those in command had imperfect and rather encouraging reports. If our men were really fighting in the Station Road on the right . . . they must be supported and a determined effort made to prevent them from being cut off and undone by the very brilliance of their success." Accordingly, Brig. Gen. D. E. Cayley sent out the order to attack with his two leading battalions, the First Essex and the Newfoundlanders.

Cayley's call came at 8:45 A.M. The Essex could not get under way. Their trenches were too clogged with the dead and dying from other units for their companies to get organized. In the Newfoundlanders' lines, Colonel Hadow took the call directly from Cayley and was ordered to advance "as soon as possible."

Hadow asked Cayley if he meant the battalion should attack without the aid of the Essex.

The reply was yes.

Hadow asked: "Has the enemy front line been captured?"

Cayley hedged: "The situation is not cleared up."

Decades later, thinking back about what happened next, Sid Frost would still turn red with anger. What Hadow should have done, said Frost, was to ask for a delay until the situation became clearer, or to point out that the communications trenches in front of him were so filled with bodies that his troops could not use them to get to the front lines. They would have to advance in the open, in full view of German machine gunners, before even reaching their own barbed wire.

Instead, Hadow passed the word to

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attack. There was no time to change formations or tactics to conform to the new situation. The men would have to advance just as they had practiced—platoons in columns, heading for the gaps in the British wire that opened into no-man's-land, the maneuver predicated on the assumption that there would be little opposition, since by then the attack was supposed to have swept far ahead of them.

Hadow was the first man out of the trench. He moved about 20 yards ahead and gestured with his ash walking stick toward the German lines. But, like other battalion commanders, he had been ordered not to advance with his men. The chance that he would be killed was too high. So Hadow had to endure the worst moment in the life of a commander. When the bugles blew, he was forced to drop into a trench and watch his men die.

The battlefield had become an inferno. Zeroed in, the German artillery was firing for effect and the chattering Maxim machine guns swept the ground, concentrating on the diagonal gaps in the British line of wire, well marked by limestone, that served as gateways to no-man's-land.

Still, there was, as far as I can determine, absolutely no hesitation in the ranks of the Newfoundlanders. Bill Newbury, John Ryan, Walter Day, Robert Tetford, Fred Coxworthy and all the rest climbed the trench ladders and quickly tried to line up in formation.

Then they began to fall. Newbury recalls Capt. Eric Ayre, commander of D Company, standing up and waving his hand and dying on the spot. Captain Ayre was not the only member of his family to die on the Somme that day. Two cousins, both lieutenants, were killed with the Newfoundlanders, and his only brother, Capt. Bernard Ayre, died with a Norfolk Regiment (p. 228). The survivors remember obliterating noise and horror that crushed the senses. When Captain Ayre was killed before his eyes, Newbury fully expected he would be the next to go. He and another man had been assigned the job of carrying a wooden ladder that was to be used to cross the second line of German trenches.

They were just starting out when Newbury heard a sound like the

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Regimental commander Lt. Col. A. L. Hadow was an ambitious disciplinarian.

quick roll of a drum. He glanced up and saw a swath of German machine-gun bullets splintering the steps of the ladder. At that instant, the other man carrying it was killed. Another man helped Newbury pick up the ladder and they started again. Then the second helper was killed. Newbury abandoned the ladder and went on alone. Ahead of him he could see the men of the leading companies—A and B—falling in windrows.

Expecting to be hit any second, he kept on and, somewhat to his surprise, found himself at the line of British barbed wire. On his own, with only a few men around him, Newbury got about 200 feet into no-man's-land when a Maxim hit him in both knees. He spun, fell and floundered

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on the ground, unable to crawl to the shelter of a shell hole.

By then, the world of the surviving Newfoundlanders had been reduced to a few yards of shell-torn earth and their lives; those who had not yet fallen expected to in a few moments. Ryan would always remember the towers of black and white smoke thrown up by the exploding German shells and the stink they made. "I can smell them yet," he told me, wincing. Ryan was near Capt. James Ledingham (p. 209), the commander of Company A, when the captain was hit in three places. Ledingham later was able to crawl back to safety. He recovered, went back to duty and was killed in battle in October 1917.

When the attack began, the job of Robert Tetford (No. 277) was to help carry a wooden bridge 25 feet long that was to be used to span the German trenches. As he and Edward Brown (No. 545) started forward, Brown was killed instantly. "He was hit just here," Tetford told me, gently placing a finger on the middle of his forehead. "Just here" was a phrase I was to hear often as I talked to the Newfoundlanders, and always in the

British field commander, Sir Douglas Haig, devised the Somme plan of battle.

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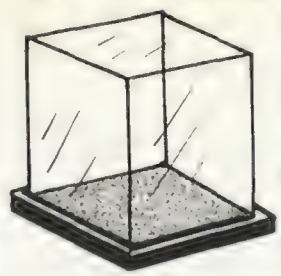

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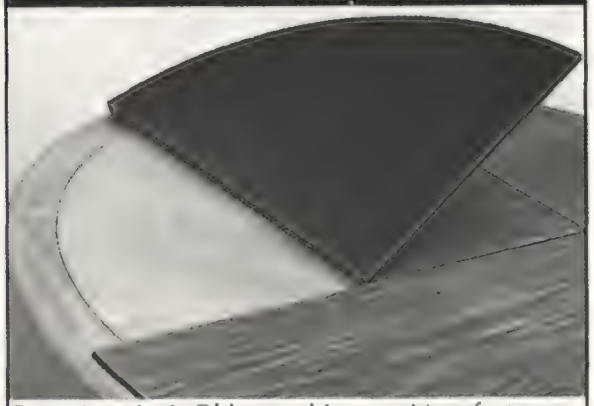

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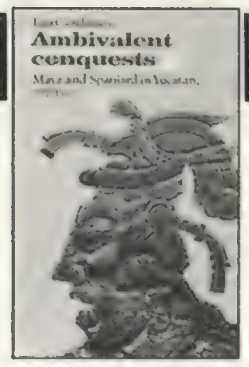

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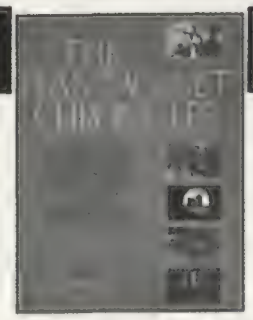

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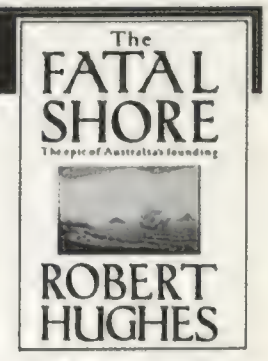

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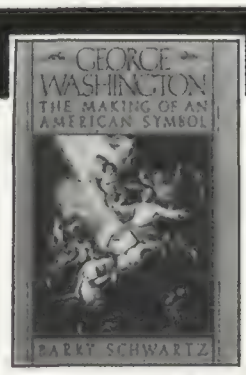

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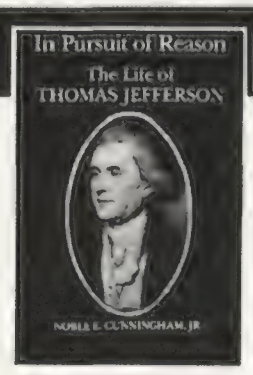

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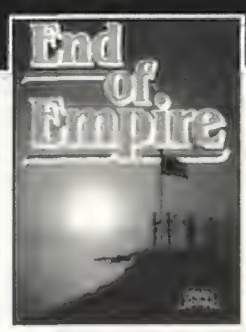

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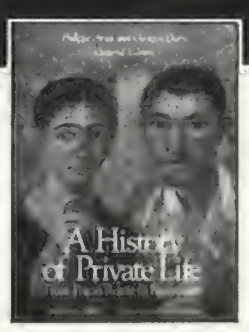

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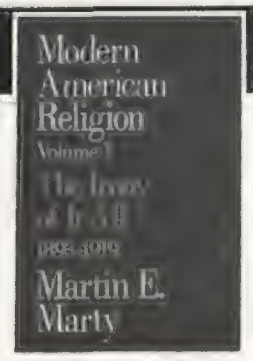

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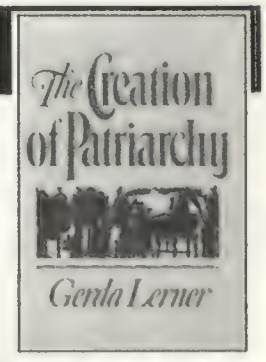

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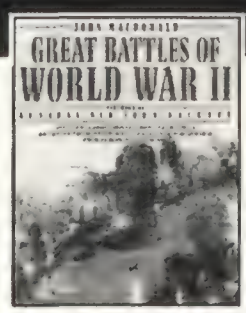

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same context—to signify a bullet hitting a man in the exact center of his forehead. The Newfoundlanders would say the phrase quietly but very precisely, looking at me closely to see if the import registered. Annihilation had come so swiftly, so precisely, so completely that the phenomenon deserved to be regarded with some awe.

When Brown dropped, the bridge fell and Tetford dived into a shell hole. Billy McNiven (No. 279) fell dead across his legs. Three or four other dead men were with them, Tetford recalled. As he lay there, a shell fragment ripped a flesh wound in his stomach.

All that day in the warm sun, Bill Newbury lay on the battlefield trying not to move in his agony so that the light reflecting off the triangle of metal on his back would not draw more German fire. That night the British came out to get him. Someone tried to lift him, but the pain was too sharp. He asked to be put back on the ground. Later they came after him with a stretcher, but again the pain was too great to bear as they tried to move him. He asked to be left alone.

The next morning, Newbury's knees were so caked with mud that the bleeding had stopped. Determined not to be taken prisoner, he began to crawl back toward the British lines. A machine gunner would spot him occasionally and stitch the ground nearby with bullets. Newbury would lie still until the shooting stopped, then creep on again. When he got to a British trench, he saw that the lip of the parapet was covered with bodies.

For a while he did not see how he could make it; he had planned on simply rolling in. Finally, with one last desperate effort, he forced his shattered knees to lift him for an instant and toppled over the corpses and down into the trench. When the pain eased, he looked around and discovered that all of his companions were dead.

According to one witness, Colonel

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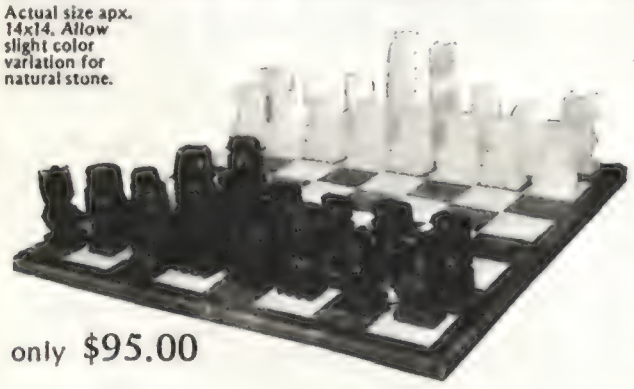

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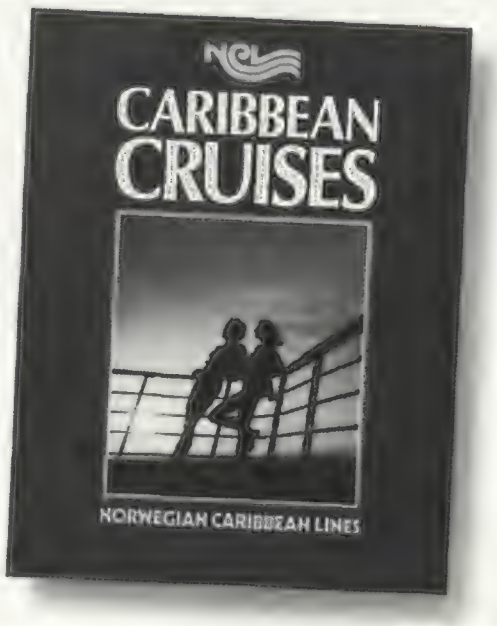

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Pvt. Ron Dunn, now 90, was Lewis gunner and one of 438 wounded at the Somme.

Hadow was a "shaken man" after watching his troops go into battle, as well he might have been. But, in the fashion of the day for British commanders, he seems to have exhibited no feeling of remorse or anguish for his role in ordering his battalion to what he must have known would be its death. In his diary, Hadow simply noted: "The regiment was nearly wiped out." I wrote to his son to ask if his father had ever talked much about what had happened on July 1, 1916. The reply was polite but unilluminating. No, his father had never spent much time talking about what had happened during the war.

The most appropriate praise was delivered by the commander of the 29th Division. He wrote: "It was a magnificent display of trained and disciplined valour, and its assault only failed of success because dead men can advance no farther."

But back in Saint John's it seemed at first to have been a famous victory. "British Launch Great Offensive," headlined the *Evening Telegram* on July 1, 1916. "German Trenches and Prisoners Captured over a 20-mile Front." On July 13, twelve days after

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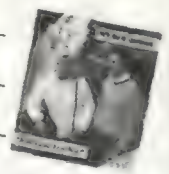

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the assault, the city still did not know what actually had occurred. Then the casualty lists began filling column after column of the *Telegram*. Nearly everyone in Saint John's must have known one of the casualties or at least known who one was—by recognizing his name from a Sunday school class long ago, or remembering him playing center forward on a soccer field.

And yet the news accounts, editorials and letters in the papers reveal none of the anguish that must have swept over the city. The suffering is all described in the heroic style of the time. Nor is there a flicker of honest feeling in the official report of Colonel Hadow, which finally arrived on July 29. "I deeply deplore the losses, but it will be some consolation to the people of Newfoundland to know that nothing could have been finer than the conduct of the regiment and it has established a reputation in this our first battle, which will ever be remembered."

The event demanded a scream, and yet none was recorded publicly, as far as I could tell. What must it have been like to walk that city at night in early July 1916? Did the sound of keening pursue you down the street?

Then I talked with Walter Day, the man who had enlisted at 15, climbed the trench ladder at 17 and somehow lived through the next 40 minutes. He was in a veterans' hospital in Saint John's, and although he was 78 years old and had just suffered a mild heart attack, he was still a vigorous man with a thick, strong hand and an eagerness to help a stranger from the United States understand what it had been like on the Somme. He nodded toward a fan in one corner of the ward. "The bullets hummed just like that," he said.

Day remembered hearing from friends and family back home how the news of the attack had devastated Saint John's, and I pushed him for an example. Then he recalled being told about the men in black: the priests and ministers who went up and down the rows of streets, paying condolence calls on the bereaved. "You could tell who had lost someone by watching where they went," said Day, and suddenly some human element of the tragedy came home—friends and neighbors watching with a mixture of sympathy and dread from behind their curtains while the clergymen went to call on families just up the street, watching with the cold realization that next time someone might ring their own bell.

Day and the other old men could not quite understand what it was they had done that would cause an

Memento mori for Saint John's businessman C. R. Ayre honors his four officer grandsons, all killed on July 1, 1916.

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American to come so far to seek them out. They talked to me in living rooms that often had pictures of themselves, young and strong and half-smiling into the camera, taken during World War I. They were too polite not to talk to the man who had suddenly showed up on their doorstep, although they often were not in good health, and one or two, such as Bill Newbury, rubbed old wounds as they spoke.

Some of the men were deaf and leaned close to catch my questions that wives or daughters, sitting nearby, proudly erect, had to rephrase and ask in louder, sharper voices. The cheeks of the men turned red as they concentrated, trying to remember how it had been—it was all so long ago.

They spoke with little bitterness. Some seemed to feel that the whole experience had been some kind of cosmic, practical joke. They had joined the service with such innocence and marched into battle with such confidence, only to find the odds so stacked against them.

When I asked why they had pulled themselves out of the trenches and walked into the deathtrap, even after it had been sprung, they could not

The body of Cpl. Robert Pitman, like those of many others, was never found.

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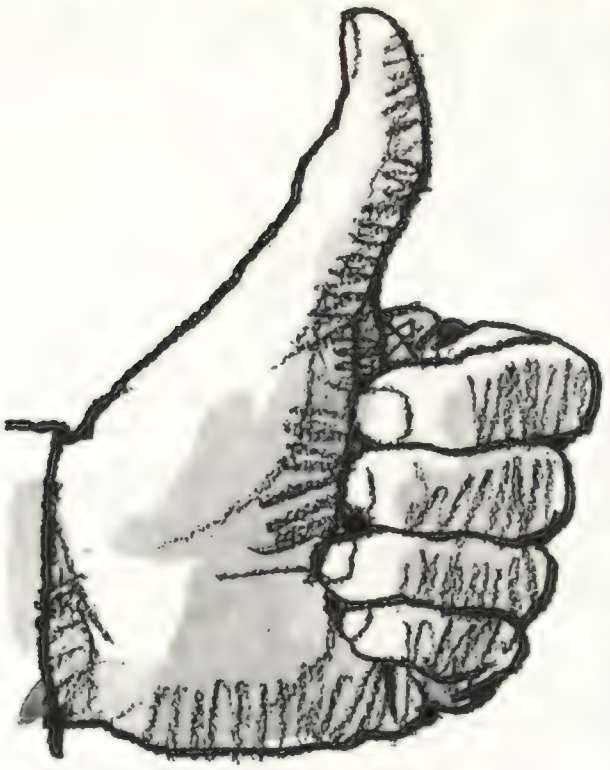

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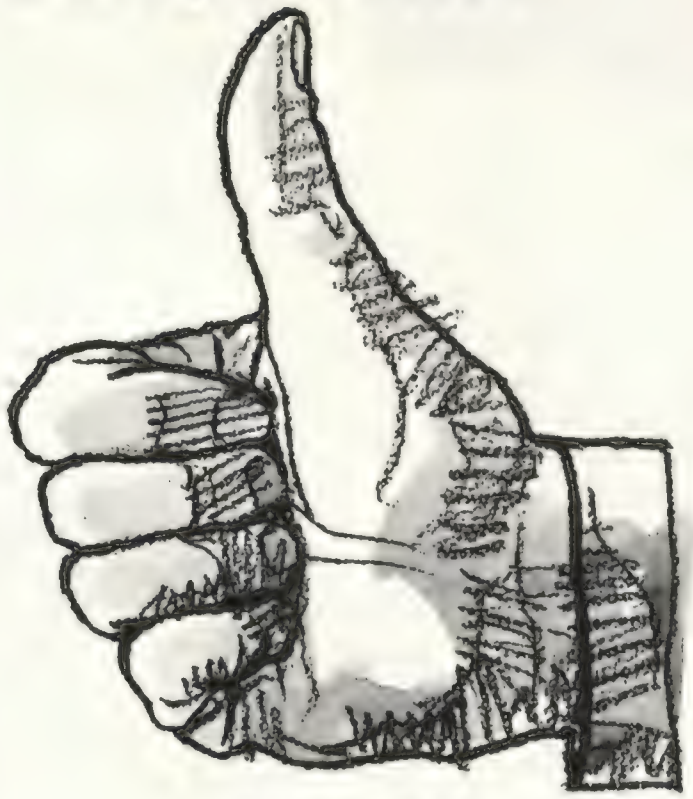

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understand the point of the question. The Newfoundlanders had done what they were trained to do, what everyone expected them to do, what they had known they should do. It was as simple as that.

I was in Saint John's on June 30, the night the Royal Newfoundland Regiment has its annual dinner, and was invited to attend the affair. A sprinkling of my new friends were there, along with veterans of World War II, when Newfoundland had sent over an artillery unit (they had tried sending infantry once).

Suddenly, there was a burst of applause. Men were starting to laugh and to crane their necks to look at the head table. I turned to see a former naval officer drinking out of what looked like a small, shallow bowl. When he was done, he turned it upside down over his head to show that it was empty, and then kissed the bottom before handing it back to a steward who was standing by with a tray full of bottles.

One of my companions explained that this was a tradition that the battalion had learned from the Scots while occupying Edinburgh Castle before shipping out for Gallipoli and the Turks. The bowl was really a quaffing cup. On ceremonial occasions it was filled with brandy or a mixture of liquors, and each officer was supposed to follow the ritual I had just observed while his friends cheered him on.

The cup gradually worked its way around the room and then the steward was handing it to me. Standing, I performed the ritual and drew the cheers, holding the cup empty above my head and kissing the bottom. I sat down, more aglow from the moment than the brandy, and only then realized the full symbolism of the event and the evening.

I had just drunk from the same cup that the young officers—half my age, most of them—had undoubtedly passed back and forth on the nights before the battle. It was about 10

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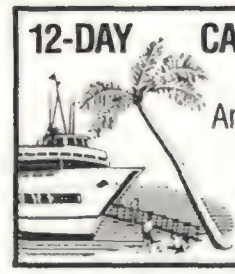

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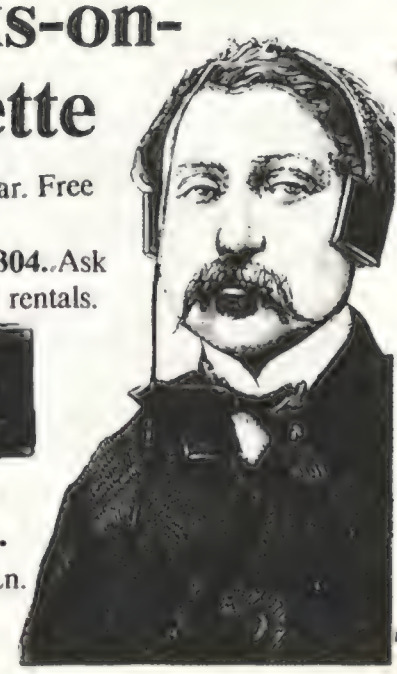

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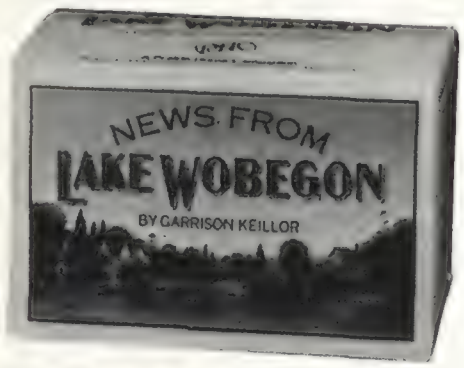

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P.M. in Newfoundland—1:30 A.M. in France. The battalion would have just about completed its long march up to the lines.

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On the old battlefield near the village of Beaumont-Hamel, the compulsion to play soldier is too great to resist. You walk along the twisting trenches and peer toward where the Germans had been, trying to sense what it had been like that day. But the sloping sides of the trenches are carpeted with grass that is brightly flecked with wildflowers.

The playacting does not work. You feel like a trespasser. Still, there is nothing to be done but to climb out of the trench and start for the German lines. All around you, the Newfoundlanders had surged up out of the earth, struggled to hoist ladders and other gear to their shoulders and walked into a hurricane.

The remains of the German trenches are only a short walk farther on. Near one or two of them are scattered pieces of rusted rubble, indefinable pieces of battlefield equipment that have been slowly disintegrating over the years.

Looking back, through German eyes, the perspective suddenly changes. You automatically start looking for targets, imagining how they would have been arrayed—groups of men, struggling to get through the gaps in their own barbed wire. Somewhere, an easy shot away, Fred Coxworthy had climbed over six dead men to reach no-man's-land.

Just inside the cemetery gateway, in a niche behind a brass grille, is a book in which visitors have left their names and addresses, and sometimes their thoughts. "In memory of Willie Scott, my brother." "We remember." "So ended the golden age." Every thought I have seems presumptuous or falsely solemn, and so, in the end, I write nothing at all. Leaving the battlefield, I reach down and pick up a piece of gray, stony chalk and take part of the battlefield of the Newfoundlanders home with me.

Close-rank gravestones in the Beaumont-Hamel cemetery mark the resting place of the British, Scottish and Newfoundland dead.

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By Barnaby Conrad

A woeful gallery of the world's lost masterpieces

By hook or by crook, and sometimes by pure prudery, many works of art have vanished or been destroyed

In Germany, 1945, a GI admires one of the many works Göring had stolen from a French collection to form his own.

The day before Christmas 1986, six canvases by Edouard Vuillard were ripped from their frames in the old Comédie des Champs-Elysées where they had been since 1913. Fortunately, the six paintings, worth $3 million, were found in February, but the ending is not always so happy.

How often these days we read of great losses in the newspapers. But it is not a new phenomenon. Art treasures, both visual and literary, have been lost or plundered or purloined since ancient days.

My favorite loss, if one can derive any pleasure from the destruction of a work of art, concerns the 17th-century Dutch painter Dirck van Hoogstraten, who was completing what was to be his masterwork, a great bacchanalian scene. The story goes that he had a goat brought in to pose at his studio. As he was putting the finishing touches on the irascible creature's portrait, he saw it eye the painting critically, lower its head and then, to his horror, he watched as it charged full steam through the big canvas.

But there is nothing humorous to be found in the theft or burning of important masterpieces. During World War II the Nazis stole from every country that Germany occupied and from every Jewish collector who was murdered or had fled.

Hermann Göring, in order to augment his private collection, did not restrict his thefts to the property of those whom the Third Reich had designated as enemies. He also stole avidly from his allies, the Italians. Two miniature panels of the *Labors of Hercules*, painted by the great Antonio Pollaiuolo in about 1465, had hung in the Uffizi Gallery for centuries; in World War II, Göring "liberated" them as a gift for his infant daughter. They subsequently vanished without a trace, their memory cherished among collectors—one of the major art losses of modern times.

In December 1962, a Pasadena hotel waiter named Johann Meindl and his wife watched a TV interview program on which an art restorer declared that many great works of art were reposing in homes whose owners were unaware of their worth. The Meindls decided to take two little pictures of theirs in for appraisal. To the delight of the Italian government and of all art lovers everywhere, except the Meindls, they turned out to be the missing Pollaiuolos and were returned to Florence. According to the Meindls, the paintings had been given to them by an old lady in Munich for kindnesses the couple had rendered her in her old age; authorities were skeptical but it would have been difficult to prove otherwise.

Le Petit Café is one of ten panels Vuillard painted for foyer of Comédie des Champs-Elysées.

After theft last year, the foyer was left with nothing but six empty frames; the works later were found.

How they acquired the pictures is still one of the mysteries of the art world, and one that will probably never be known.

Although the Pollaiuolo paintings managed to survive the vicissitudes of war, thousands of other artistic and architectural treasures did not. We are almost hardened to the inevitable ravages of war, such as the destruction of most of the Parthenon in 1687 when a Turkish powder magazine exploded, but nothing is quite so infuriating as to read of the willful destruction of art by humans on the grounds of morality.

When Emmeline Pankhurst, the leader of the suffragettes, was jailed in 1914, one of her zealous followers, May Richardson, marched into London's National Gallery in a burst of moral outrage. With a hatchet she attacked Velásquez's celebrated nude, *Mirror of Venus*, intending to destroy it. Fortunately, she didn't succeed. Nor, in recent times, did the two certifiables who attacked Michelangelo's *Pietà* and Rembrandt's *Night Watch*.

An even more horrifying instance of human smugness took place after John Ruskin had been appointed by the trustees of the National Gallery to sort and classify the accumulation of work left by the great painter Turner. In 1857 he discovered to his astonishment a mysterious cache of paintings—things that he believed to be shameful and unjustifiable. Frank Harris, in *Contemporary Portraits*, relates Ruskin's own account of this unhappy mission:

". . . I went to work to find out all about it, and I ascertained that my hero used to leave his house in Chelsea and go down to Wapping on the Friday afternoon, and live there until Monday morning with the sailors' women, painting them in every posture of abandonment . . . What a life! And what a burden it cast upon me. What was I to do? For weeks I was in doubt, and miserable, though time and again I put myself in Tune with the Highest, till suddenly it flashed on me that perhaps I had been selected as the one man capable of coming, in this matter, to a great decision. I took the hundreds of scrofulous sketches and paintings and burnt them, where they were, burnt all of them . . . Don't you think I did right? I am proud of it, *proud*."

When the distinguished author and explorer Sir Richard Burton died in 1890 he left behind a candid manuscript, the fruit of long work, which he considered his magnum opus. "I have put my whole life and all my life blood into that *Scented Garden*," he had said. "It is my great hope that I shall live by it. It is the crown of my life."

The foremost Orientalist in the world, Burton was also a dedicated poet, diplomat, fencing champion and linguist; he spoke 28 languages (one of them pornography, people said maliciously). Yet, after his widow, Isabel, went through the manuscript of *The Scented Garden*, she burned it. Burton's devoted readers were horrified. As Lesley Blanch writes in *The Wilder Shores of Love*:

"She is commonly held to have shoveled the manuscripts on the fire in an excess of Victorian prudery. But legend has it that Burton's spirit appeared to her, ordering its destruction, and she herself recounted this to several friends. The apparition, she said, was stern, commanding 'Burn it!' '. . . My husband had been collecting for fourteen years, information on a certain subject . . . The Scented Garden . . . treated of a certain passion. Do not let anyone suppose for a moment that Richard Burton ever wrote a thing from the im-

The author, a writer and artist, teaches portraiture at University of California, Santa Barbara.

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pure point of view. He dissected a passion as a doctor may dissect a body, showing its source, its origin, its evil and its good.' "

She goes on to say that Burton told her he anticipated *The Scented Garden* would cause a great outcry in England, and that by comparison *The Arabian Nights* was a baby tale. Burton had written to a friend, his cotranslator of Catullus, describing it in these terms:

"It will be a marvellous repertory of Eastern wisdom; how Eunuchs are made, and are married; what they do in marriage; female circumcision, the Fellahs copulating with crocodiles, etc. Mrs. Grundy will howl till she almost bursts and will read every word with an intense enjoyment. . . ."

A similar act of pyrolysis was perpetrated after the death of Lord Byron, probably the most influential of the English Romantic writers. Byron died in Missolonghi, Greece, on April 19, 1824. When the news

Pollaiuolo panel, stolen from the Uffizi in World War II, surfaced in California.

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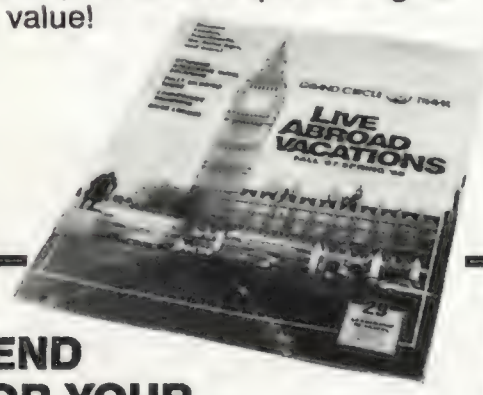

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Supporter of imprisoned suffragette leader took a hatchet to Velásquez's *The Mirror of Venus*: it has since been restored.

reached England, a fierce and involved struggle began among the many people concerned with the fate of his *Memoirs*.

The *Memoirs*, written between 1818 and 1821, consisted of more than 400 pages of frank and complete reminiscences of his many escapades, his cynical marriage, his farcical honeymoon (or "treaclemoon," as he sneeringly referred to it) and homosexual experiences. They had been given by Byron to poet Thomas Moore, who in turn had assigned them (with Byron's consent) to publisher John Murray for 2,000 guineas.

Augusta Leigh, Byron's half sister, wanted the manuscripts and their copy preserved but never published; Lady Byron wanted them destroyed. Thomas Moore wanted to buy them back, supposedly for Mrs. Leigh but more probably to copy out portions that he wanted to publish. John Cam Hobhouse, an old friend and traveling companion of Byron's and John Murray himself, wanted them destroyed, believing the contents unfit for publication. Release of them, he said, "would render Lord Byron's name eternally infamous."

Letters and visits poured back and forth and heated discussions took place among the many factions. On May 17, 1824, a group of men—Hobhouse and Murray, a Sir Robert Wilmot Horton and a Col. Francis Doyle acting for Lady Byron, Thomas Moore and a friend named Luttrell—met in the library of John Murray's house at 50 Albemarle Street and burned the manuscript and the copy of it in the fireplace.

Georges Rouault burned a great many of his own works. In 1917 Ambroise Vollard became Rouault's exclusive dealer and Vollard furnished him an atelier in his own house. They had a special agreement whereby Vollard could remove only the artist's signed paintings—those Rouault considered finished. At the time of Vollard's death in 1939, more than 800 unsigned works were stored in Vollard's house. In 1947 Rouault won a lawsuit against the heirs of the Vollard estate for the return of his paintings and recovered about 700 of them. After long hesitation, he decided that he would not be able to bring them up to his standard of perfection. On November 5, 1948, before a witness from the court, he burned 315 of his own canvases in a factory furnace.

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A servant was responsible for the loss of the first book of Thomas Carlyle's *French Revolution*, a labor of five intensive months. Carlyle had given it to his friend and adviser, the philosopher John Stuart Mill, who took it off to read and make notes. A servant found the manuscript sheets on a table and used them to start the morning fire. Although this loss left Carlyle in desperate financial straits, he would accept only 100 of the 200 pounds offered by Mill and that, in part, to ease his friend's guilt and distress. Wearily, but gamely, he set about to rewrite the work, finishing it seven months later.

Of Joseph Conrad's 20 years at sea there remains no personal written record other than two small notebooks, "The Congo Diary," which his wife, in later years, supposedly saved from the wastebasket twice. Over this long period at sea, he wrote more than 200 letters to his uncle in Poland that have never been found. Conrad himself, according to his wife, burned almost all correspondence of a personal nature. This was possibly because of the sailor's compulsive tidiness, possibly because of a strong sense of privacy.

Conrad's loss was intentional, but in some cases the claim of loss can be a convenient excuse. Into this category falls the strange loss, if indeed it was a loss, of *Seven Pillars of Wisdom*.

The Virgin of Michelangelo's *Pietà* suffered loss of her left arm and nicks in her face by a man wielding hammer in 1972.

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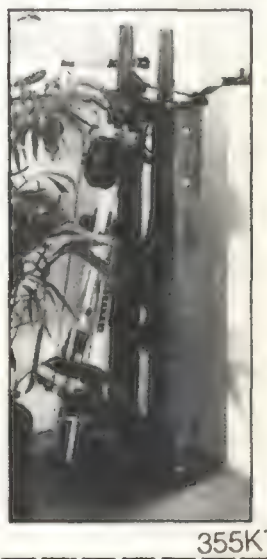

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Laszlo Toth, who attacked the *Pietà*, was arrested for the crime in Rome.

The enigmatic and controversial T. E. Lawrence began writing his adventures in Paris in April 1919, continued to write on a journey to Cairo, and in Oxford toward the end of that year had all but finished the work. In November 1919, according to his story, he was en route to Oxford from London carrying with him a black bag containing eight of the ten completed "books." He claimed he went to the station buffet while waiting to change trains in Reading and left the bag under the table where he had been sitting. He telephoned upon reaching Oxford but the bag had vanished completely and was never seen again. Lawrence had destroyed nearly all his documents and notes as he was writing. At the insistence of an old friend, D. G. Hogarth, he began to rewrite, armed with a few notes and a remarkable memory. The second draft of nearly half a million words was finished in 1922. There are numerous conjectures about his story.

In *The Desert and the Stars*, Flora Armitage writes: "It is open to speculation whether he lost it purposely,

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either because he was dissatisfied with the draft as it stood, or because he wanted an excuse for abandoning the project." It has been suggested, too, that Lawrence did not really lose the manuscript but sought to raise envious admiration by rewriting solely from memory. Col. Alan Dawnay had read both texts and reported that they were almost identical.

When great works have been missing for decades, we often give up hope. But nothing seems impossible after the discovery of the lost Boswell journals. Here is a mystery to rival any ever written in fiction. Except, of course, that a fiction writer could never get away with it as there is too much coincidence and improbability about it all.

The story starts in London, on May 16, 1763, when a young Scot named James Boswell met for the first time the distinguished scholar Dr. Samuel Johnson. Out of this meeting and the ensuing friendship came what is considered the greatest biography ever written, *The Life of Samuel Johnson*, published with considerable success in 1791. Boswell's extensive, superb journals were not published and indeed were not even known to exist until the mid 1920s. (The executor

Sir Richard Burton's work *The Scented Garden* was burned by prudish widow.

Lord Byron's steamy memoirs were ceremoniously burned by committee.

of his personal papers had written that one of his letters had "burned in a mass of papers," which were assumed to be all of his other personal writings.)

The first clue that there were undiscovered Boswelliana about came in 1840 when a Major Stone, an educated Englishman in the employ of the East India Company, walked into a shop in Boulogne, France. What he bought is unknown and doesn't matter (it has been conjectured as being fish, sausage or cheese) but what it was wrapped in was a letter and, to his amazement, the major saw the signature of James Boswell. It was hard for him to believe his eyes. With an attempt at casualness, he asked the proprietress if she had any more nice letters like this. Yes, as a matter of fact she did. Major Stone walked out of the shop with nearly 100 of some of the finest letters every written in the English language. They were from Boswell to his good friend the Rev. William Temple. (Temple's eldest daughter had married a man with extravagant tastes who eventually escaped his creditors by settling in a town near Boulogne. Boswell's letters seem to have traveled to France with the daughter and her husband, but

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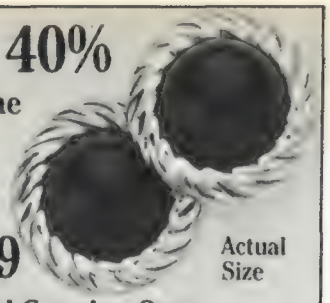

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how the letters got to the shop is unknown.)

This was an exciting find to the scholars, who up to this time had thought that all Boswell's letters had been burned. The great biographer's conventional descendants were considerably embarrassed by the fact that Boswell had fathered an illegitimate child at 27, had contracted venereal diseases, had continued to wine and wench his way through life long after he was married and had consorted with the strangest types of friends. Above all, Boswell's family was not proud of his association with Samuel Johnson. They believed that Boswell had degraded himself and them by his obsequiousness to Johnson.

Then in 1920, Professor Chauncey Tinker, one of Yale's beloved teachers and a fervent believer that Boswell was one of the great writers of the world, began to question the executor's handwriting. Could it have been "*buried* in a mass of papers" instead of "burned?" On a wild chance he inserted a letter in *The Times Literary Supplement* asking for any information about unpublished Boswell letters. An anonymous card was soon received advising him to try Malahide Castle. Another card

Joseph Conrad burned almost all of his notes and letters that he received.

T. E. Lawrence claimed to have lost a major work; many never believed him.

said that the Lord of Malahide Castle had "lately imported here an escritoire of Boswell's which is full of Letters, so far uncatalogued."

Tinker excitedly did some research in *Burke's Peerage* and learned that Malahide Castle belonged to Lord Talbot, Boswell's great-great-grandson. Tinker wrote to Lord Talbot immediately but got a cool reply and no admission that there were such papers. In 1925 Tinker went to Britain and through friends wangled his way into the castle. Lord Talbot and his wife were less than friendly, but they did admit finally to having some Boswell papers, which they said they would never have published. They *would*, however, let Professor Tinker have a glance at them. Whereupon they went to Boswell's ebony cabinet and opened the large drawer. It was jammed with manuscripts, letters and journals by Boswell. Tinker was allowed to handle a few and he did so with trembling hands. "I felt like Sinbad in the valley of rubies," he later said. But then the drawer was closed, forever, as far as the Talbots were concerned. Tinker went back to America in utter dejection.

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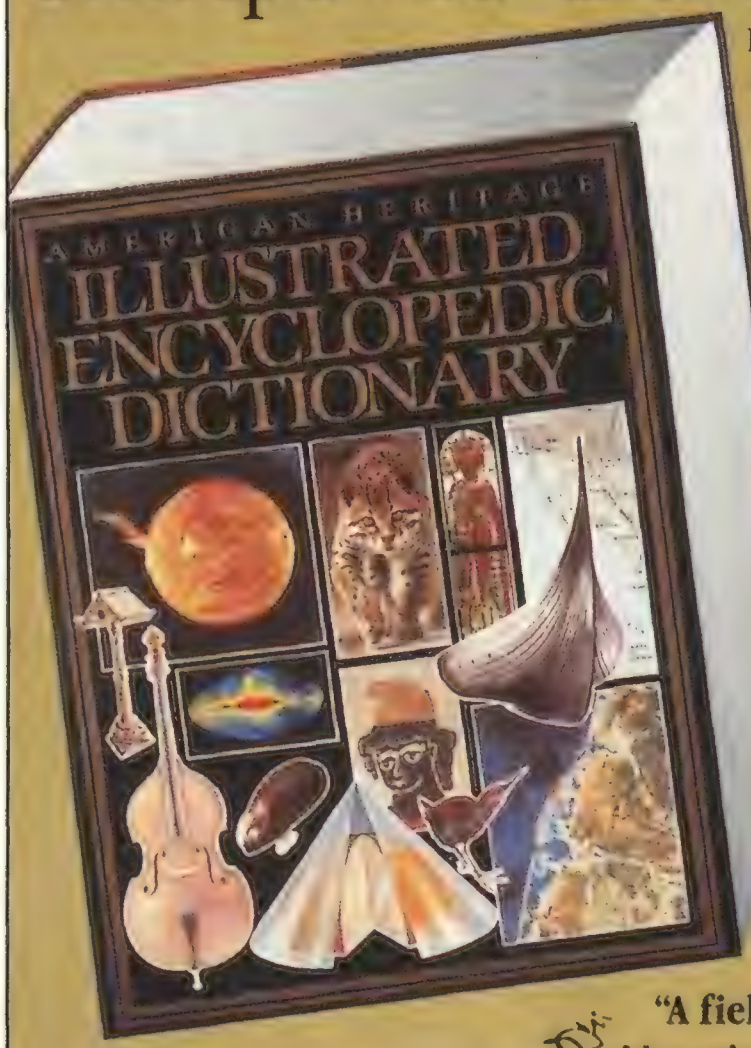

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discovery, and A. S. W. Rosenbach, the famous American collector, sent a cable to Lord Talbot offering him a quarter-million dollars for the papers sight unseen. It is said that Talbot marched into the American Consulate carrying the cablegram, saying, "*Who* is this person? I would appreciate your asking him not to correspond with me. We have not been introduced."

It remained for a distinguished American Boswell fan by the name of Lt. Col. Ralph Isham to do the impossible in 1926. A suave gentleman of many parts, his charm was matched only by his money (railroads) and his literary zeal. Somehow, through a tremendous display of diplomatic legerdemain and patience, this ex-Yale man and big-game hunter somehow managed to talk the Talbots into selling a letter to Boswell from Oliver Goldsmith for $2,500. Then he eased them into agreeing to publish some of the letters and finally into selling them all to him. But the story wasn't over. One afternoon in 1930, the Talbots were entertaining and they thought it would be pleasant to play croquet. The servants rummaged in

James Boswell's writings about his own life weren't discovered until 1920s.

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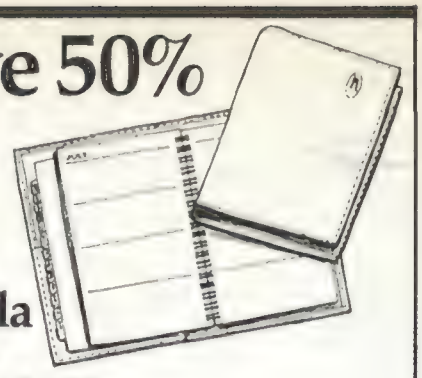

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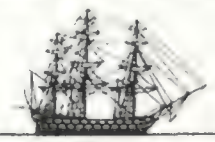
House painter Vincenzo Perugia stole *Mona Lisa*, later was apprehended.

a closet and found an old croquet box, but instead of mallets it was stuffed with more Boswell papers, which Colonel Isham, of course, acquired from them.

Also, in 1930, another 1,600 letters and manuscripts, including the complete manuscript of Boswell's *London Journal*, were found at Fettercairn House in Scotland, the house of a descendant of one of Boswell's literary executors. Isham acquired them. By now Isham's bankroll was getting thin, but he was a dedicated man. In 1937 he went back to Malahide Castle for a last look around and uncovered still another batch. He scraped together the money and bought them. Then in 1940, the village officials, looking for space to store wartime food supplies, took over a long-unused stable at Malahide. In the loft was a wooden box containing—yes, still more papers by the prolific Scotsman. And still more in 1948.

By 1949, after 23 years of collecting, Colonel Isham had tied up his entire fortune in pieces of paper with Boswell's handwriting on them. With the reluctance of the true collector, he decided to sell the collection to Yale, which paid a reputed $500,000 for them. Far more important than the money was Isham's satisfaction at having given the world a literary



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treasure trove. More than a dozen volumes of Boswell's journal have been edited and brought out to great acclaim, the last of which, *Boswell: The Great Biographer, 1789-1795*, will be published in the fall of 1988.

So, sometimes things do turn out right and lost treasures do return. Leonardo's *Last Supper* began to deteriorate because of the technique used and dampness of the chapel wall on which it was painted. The monks themselves desecrated the mural in 1652 by cutting a door through Christ's feet; and in 1796 Napoleon's troops used the place for a stable and the painting for target practice. Now, Pinin Brambilla Barcilon, an Italian restorer, has been working since 1981 on the 29-by-15-foot mural in the Church of Santa Maria delle Grazie, Milan. It is two-thirds finished.

A Leonardo work that was once considered lost came back miraculously unharmed, to the delight of millions. It was none other than the most famous portrait in the world, the *Mona Lisa*. On August 22, 1911, people were shocked to read that the beloved painting had been stolen from the Louvre. There were some interesting facts about the crime: the 21-by-30½-inch oil was stolen on a Monday, a day the museum was closed to the public. On that day, only photographers with passes, art historians and workmen, some of whom were doing decorating work, could go in or out. It was therefore surmised that the thief must have been one of those few who had a right to come and go. Nevertheless, the culprit could not be found. The head curator of the museum was fired, the newspapers complained about the inability of the police to track down the most familiar face in the world, but still no painting and no thief.

Even after two years and more, there was not the slightest clue to the real thief's identity. Then the Italian art dealer Alfredo Geri of Florence received a letter from Paris signed "Leonard" offering to sell him the *Mona Lisa*. The art dealer, of course, thought it was either a joke or someone trying to sell a fake. But on the off chance it might be true he took the trouble to answer the letter, expressed interest in buying the picture and urged the man to come to Florence. A few weeks later, a small mustached man of about 30 walked into Geri's office. He said he was the possessor of the *Mona Lisa* and was proud to return it to its rightful country. Five hundred thousand lire, please: the *Mona Lisa* was in his hotel room nearby. The art dealer was still highly skeptical but went with him to the hotel. There the man opened a padlocked chest. Under a few paintbrushes and a mandolin was a false bottom and under that the undamaged *Mona Lisa*. Geri

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called the police. They found out that the man's name was Vincenzo Perugia, a house painter by profession. He had stolen the picture for the "glory of Italy."

It turned out that he had spent the night hidden in the Louvre with accomplices. "One morning I joined my fellow decorators at . . . the Louvre," he said. "I was wearing the same long, white workmen's blouse as they did and attracted no attention."

He merely walked up to the painting and took it off its hook. Then he went into the long Galerie des Sept Mètres and down a back staircase to the landing. He slit the tapes that held the painting and removed the frame. He slid the portrait up under his white smock and put it under his arm; as he started out, he ran into a plumber. Perugia kept icy calm. "Open the door for me, will you?" he asked casually. The plumber automatically did and Perugia crossed the courtyard to the gate leading to the Quai du Louvre. The gate was open owing to cleaning work in progress; the guard had stepped away for a moment to get some water, and in an instant Perugia was safely out on the street.

He went to jail and the stolen work was taken jubilantly back to Paris. Oblivion was not to be the *Mona Lisa*'s fate as it has been for so many other masterpieces.

"Let that which is lost be for God," says a Spanish proverb, and it is a generous thought. But when one considers the variety and quantity of objects lost to Mankind forever, one can't help being a trifle envious and a little resentful of the Great Collector in the sky with his full gallery and library.

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Book reviews

Winsor McCay: His Life and Art
John Canemaker
Abbeville Press, $49.95

Winsor McCay is one of the two finest and most inventive artists in the history of the American comic strip (*Krazy Kat*'s creator, George Herriman, is the other), but only now has a biography of the cartoonist been published. John Canemaker gives us some sense of McCay's childhood in Michigan, his student years in Ypsilanti, his first job in Chicago and finally his success in Cincinnati, first as an artist in a dime museum and then on the *Commercial Tribune*. Documentation of his early years is scarce so the book is somewhat heavy on "perhaps" and "must have" to indicate what might have occurred, and apparently no examples of his early work survive, at least not until he joined the newspaper in 1898. Much of the material on his personal and professional life derives from anecdotes, interviews and the unpublished biography that Padraic O'Glasain wrote in 1941. Even so, enough of the man comes through to provide a context for our appreciation of his major work.

The cartoonist's great period was during the years 1903-11, when he worked for the Bennett newspapers in New York—the *Herald* and the *Evening Telegram*. During that period, as Canemaker points out, McCay drew "hundreds of editorial cartoons and spot illustrations, and he created seven comic strips that explored the creative possibilities of the form." Although his technical skill and his eccentric imagination can be seen in strips like *Little Sammy Sneeze* and *The Story of Hungry Henrietta*, his major achievements were *Dream of the Rarebit Fiend* (*Evening Telegram*, 1904-11) and *Little*

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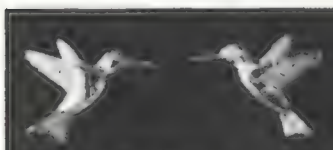

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Nemo in Slumberland (*Herald*, 1905-11). During this time, he saw Little Nemo become the hero of a Victor Herbert musical; and McCay himself became a vaudeville headliner as a quick-sketch artist, and made his first experiments with animation. Then, alas, he signed with William Randolph Hearst.

Canemaker suggests with no hard evidence that McCay chose to leave the *Herald* because his employer would not allow him to go to Europe with his vaudeville act. There is some support for the idea in a streamer, reprinted from the *Boston American*, in which McCay's "Funny Folk" celebrate their new Hearstian home; a jubilant Little Nemo crows, "Now we can do anything. Go where we please!" That home turned out to be as unreliable as buildings often were in Little Nemo's dreams. Hearst presumably bought McCay, as he bought most of his stars, because a built-in following came with him. Then he and his martinet-philosopher editor, Arthur Brisbane, proceeded to destroy what was most attractive about McCay's work. The color process available at the *American* was not nearly as sophisticated as that at the *Herald*, and Little Nemo, whose dreams once violated the comic-strip frame to suit the needs of the fantasy, was trapped by conventional comic-page space. Since George Herriman was allowed to play with frames in the other Hearst paper, the *Journal*, the restrictions may have been more psychological than graphic. Certainly, the *American* strips were never as imaginative as those in the *Herald*, and neither this version of *Little Nemo* nor the other strips McCay tried for Hearst held readers. That presumably suited Hearst, who wanted McCay as an editorial cartoonist. Brisbane is supposed to have called McCay into his office and explained, "You're a serious artist, not a comic cartoonist," awarding him with Brisbane's idea of a signal honor—he could give up comic strips to "draw serious cartoon-pictures around my editorials." McCay was an accomplished editorial cartoonist—Canemaker reprints a marvelous anti-imperialist cartoon he did for *Life* in 1899. But even that talent was not used fully by the Hearst organization because Brisbane often dictated both idea and image, forcing the fertile if convoluted mind of McCay to lapse into the direct and the obvious. Even so, except for a two-year defection to the *Herald Tribune*, where Little Nemo failed to find an audience, McCay stuck with the Hearst organization until his death in 1934.

Hearst also managed to get McCay out of vaudeville (occasional lapses permitted) which left him with just one imaginative outlet away from his *American* chores. He continued to work with animation, at first as an adjunct to his vaudeville act and then for its own sake.

Canemaker, whose documentary *Remembering Winsor McCay* (1976) featured excerpts from McCay's films, is primarily a filmmaker and a historian of animation. For that reason, he often discusses McCay's comic strips in terms of the way in which the cartoonist conveys motion and he devotes almost as much space to McCay's animated work as he does to his comic strips. Given both the quality and the historical importance of that work, the biographer's use of space is justified. As animation moved from the detailed and dedicated work of the single artist to the factory method, McCay became disappointed

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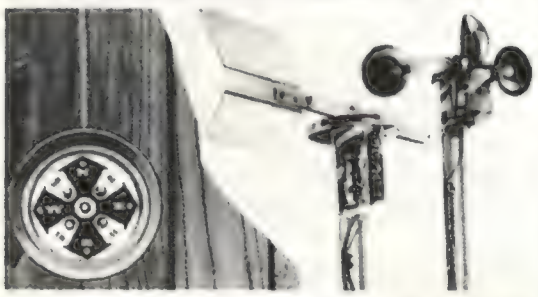

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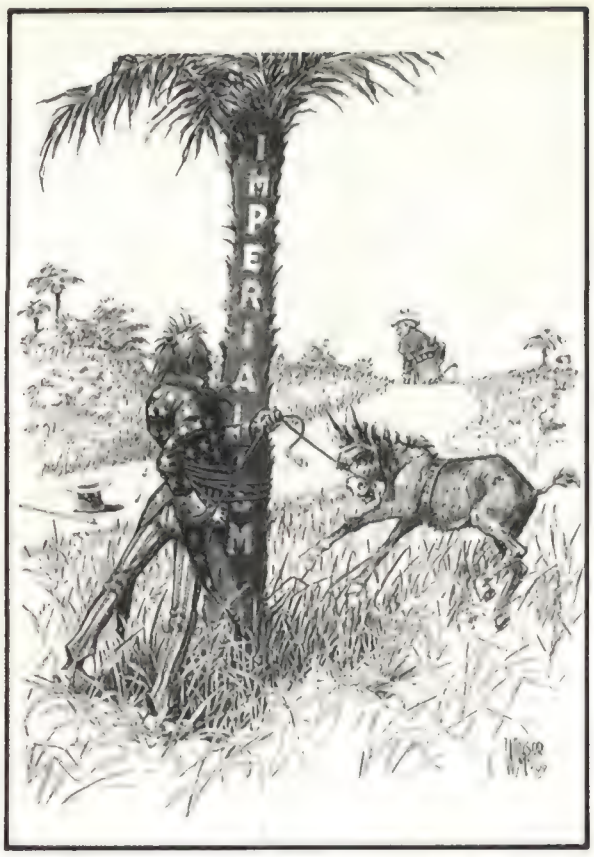

McCay cartoon for humor magazine *Life* displays his fine use of perspective.

with what he had originally seen as a new art form. After 1921 he did no more films, and in 1927, when a group of animators gathered to honor his pioneer work in the medium, he complained that his hosts had turned an art into a trade. His summation: "Bad luck!"

Anyone who has been charmed by *Gertie the Dinosaur* or startled by the power of the animated documentary *The Sinking of the Lusitania*, in which the second explosion shoots out toward the audience, knows that McCay's films have a continuing esthetic appeal. Still, his reputation as an artist rests on *Little Nemo in Slumberland*. The device is conventional—the dream sequence that ends when Nemo awakens—and the characters, carefully defined types, always respond to unusual circumstances in the same way. But, the star of the strip—the artist—constantly surprises with a background that is beautiful or frightening or both at once. To ride with Nemo and the Princess in the dragon's mouth, to fall with Nemo into the lake of cranberry sauce and then struggle through a celery forest (a Thanksgiving strip), to turn into ice with Nemo and then melt away in front of the stove, these are adventures that speak not only of shared dreams but of the mind, the wit and the controlling hand of Winsor McCay.

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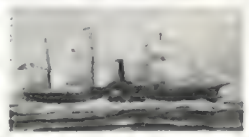

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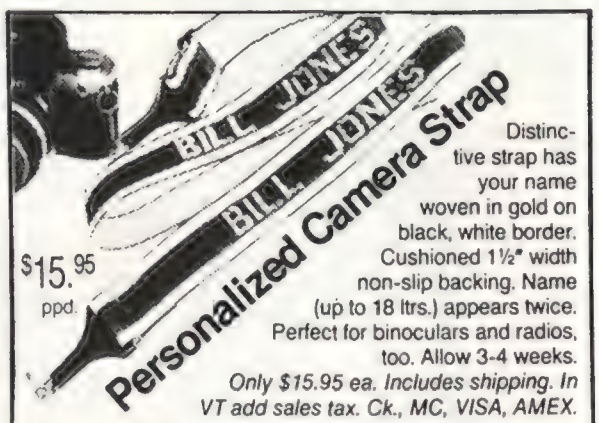

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In Deep: Country Essays
Maxine Kumin
Viking, $16.95

How long has it been since you were invited to a farm home in the New Hampshire hills? Quite some time, I'll bet. It was for me. My own homeplace, half a century, half a continent away, has long since gone back to wind and grass and so I was pleased to accept Maxine Kumin's invitation, which will come to you as it did to me, in the form of a handful of essays all nicely stanchioned between the covers of this, her 15th book.

Kumin and her husband managed to do what the rest of us only threaten—get away to the country. They found the south slope of a wooded hill and cleared a field or two, put up some fence ("Making fences presupposes not only pastures but a storehouse of diligence"), bought several horses, planted a few seeds. Now they're enjoying a stubborn serendipity at the end of a steep and rutted lane, having traded "easy access for solitary splendor." Maxine still writes, of course, still travels and teaches out there in the world, wisely remembering John Donne's admonition that none of us is an island.

Be advised, however, that this is not your gentlemanly, pseudoscientific, Louis Bromfield approach to country living. This book is as genuine as a Ball jar with wire bale and rubber-ring sealer, as personal as a foal's first breath, the suck of barnyard mud, the snap of a July green bean. No summer gardener in Gucci bonnet, this lady. Kumin strides her bosky hills in four-season boots, fixing fence in spring, battling blackflies in summer, canning assorted manna in fall and thawing water for her beloved horses at 30 below. "When, on a fierce, blizzardy morning, the owner reluctantly puts feet to floor, jacket to frame, dons boots and gloves, and sallies forth to the barn, a chorus of nickers arises from the throats of the Family Horses. The basso profundo of the bossy gelding mingles with the middle voice of the mare. The ecstatic greetings of the yearling filly, sounding in the upper register, override them both."

In truth, this collection could have been titled *Horses I Have Loved* with a subtitle reading *And Wild Mushrooms I Have Gathered.* Kumin knows both intimately, but her relationship with the horse is the one with love in it. Here is a Pulitzer Prize-winning poet who finds sitting up with pregnant mares at night and mucking out stalls in the morning a fine time for creative thinking. Isn't there a moral here for us? Shouldn't we all have a few stalls to muck out?

Kumin takes us back in her woods, in deep, to hunt the wild mushroom, and so precise is her study of this fleshy fungus of the class Basidiomycetes, so helpful her description of what is safe to eat and what is not, that if you will but listen closely and take a few notes, you will never have to count yourself among the six dozen or so mushroom fatalities occurring each year in this country. ("Best of all, go moreling the first season with an old-timer and learn your craft in situ.")

It was destiny that I read this book, I who have ridden a horse to library as well as to trail, who can remember to this very day and hour the taste of fresh-picked mushrooms fried in cracker crumbs and butter. (It's all right, Maxine, they were morels.)

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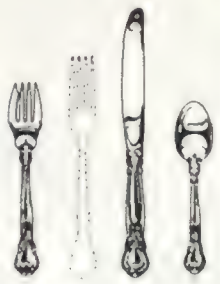

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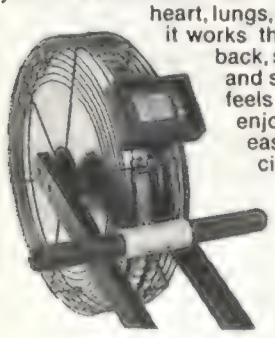

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There's something for everyone in this folio of pieces. Even if your rural experience totals up to no more than a visit to Grandma's farm one summer, you can still savor the heart-place wisdom of an essay like "The Country Kitchen," that Action Central of every farmhouse, that immense core room where the food smells swirl, the kids play their games and dye their eggs, where the wood stove pops in rhythm to the wind and the cat lies down with the dog. "Consider," Kumin says, "the democracy of the country kitchen as opposed to the scullery mentality of the separatist kitchen. . . . Think how many daily transactions take place in the country kitchen. How many feet enter, cross and leave it from first light to bedtime, year-round. . . . Merely the steady rhythm of the life of the farm and the people who live here. Making all seasons better."

This is a thoughtful, intimate book about a life in which you cut your own wood and grow your own food. Maxine Kumin could bask equally in Emerson's tribute to an earlier New England poet-naturalist, Henry David Thoreau: "It seemed as if the breezes brought him/ It seemed as if the sparrows taught him/ As if by secret sight he knew/ Where, in far fields, the orchis grew."

William Dieter
Denver novelist

Fierce Attachments: A Memoir
Vivian Gornick
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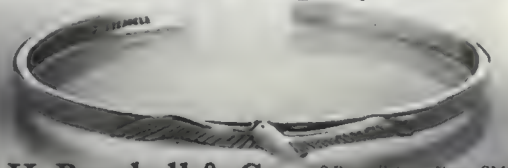

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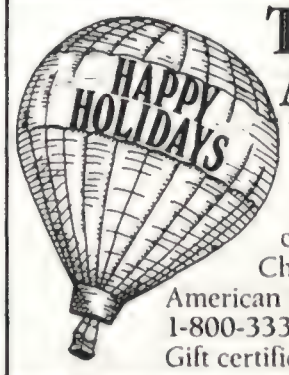

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Podhoretz's phrase, "making it." Now, she looks back and is eloquently haunted by what she sees. Classic circumstances, but with a twist.

It seems that the author, since childhood, has been near-literally coming to grips with women, notably her tradition-bound Jewish mother and Nettie, a vying "role model" in Vivian's mind. The two are utterly dissimilar.

Her mother, through the author's glass darkly, is an intelligent, fascinating creature caged for life in deluded dreams of a good marriage to Vivian's late father—caged, in other words, in what feminists simplify as nonfeminists' self-suppression. Vivian and her mother clash constantly, a condition Vivian here interprets as sexual tension, or a variation of Freud's Oedipal theme. (How, one is curious, would her mother have interpreted it? Or her father?) Widowhood, Gornick says, "provided Mama with a higher form of being. In refusing to recover from my father's death she had discovered that her life was endowed with a seriousness her years in the kitchen had denied her. . . . Mourning Papa became her profession. . . ."

Neighbor Nettie, on the other hand, is an outright sensualist who allows herself to be used by various men in young Vivian's witness, thereby captivating the author through her own flailing marriage and later years as a successful writer.

Vivian's five-year marriage to a Gentile painter is described as at first stimulating and ferocious, then ultimately exhausting. "It was a marriage born of spiritual fantasizing," rationalized, she explains, by the passion they each had for their own art. For a time, she went through what she perceived as the correct motions, but gradually the feminist dirge began to surface: "I remember taking an hour and a half to prepare some godawful casserole dish out of a woman's magazine, the two of us wolfing it down in ten minutes, then me taking an hour to clean up the mess, staring into the sink thinking, Is this it for the next forty years?"

Yet, a discerning reader may conclude that their marriage was lost to more than the feminist lament and subsequent growth of a writer. Another phrase, "our confusion, our longing, our paralyzing intensity," may better explain emotional bonds broken—but were they ever truly, lovingly made?—among many artists and intellectuals of Vivian Gornick's (and my own) generation.

Describing her fellow students in the English department at the University of California, Berkeley, the author writes, "Secretly I think, most of them yearned to make connection. But the secret remained a well-kept one."

This book, in many ways, is a grasp for connection as a postlude to success. Stripped almost too sheer of what Ibsen called "vital lies," it is not a pretty book. Nonetheless, by dint of fine writing, there is joy spun of anguish in *Fierce Attachments*. Consider, for instance, this Bronx cameo, one of many small gems that gleam throughout: "And there was Mrs. Kerner, a tiny, birdlike woman who ran around with her hair wrapped in a cleaning rag, her gestures wild, her manner crazily abrupt. She would stop people she didn't know in the grocery store or the butcher shop or at the druggist's, bring her hands together in a pair of loose fists in front of her face and, her brown eyes shining madly, say, '*Oy*, I was reading just today a bee-*yoo*-tee-ful story

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"The unhappiness has to be made alive before anything can happen," Vivian Gornick writes. Made alive it is. And thus, there is art.

Barbara Hall
New York reviewer
and writer on education

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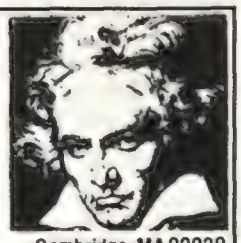

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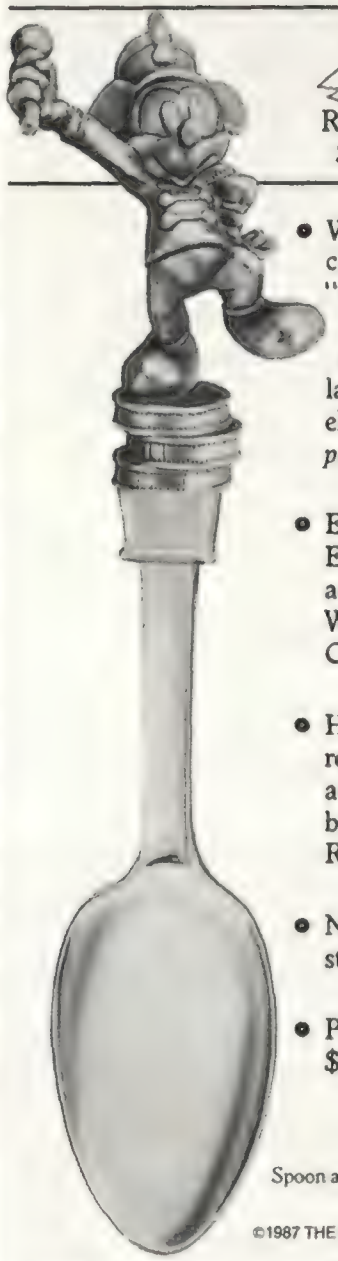

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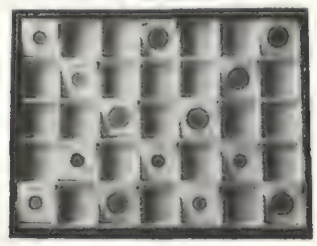

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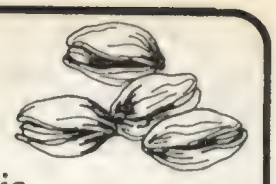

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Smithsonian highlights

A popular new attraction on the Mall is the Imax double feature that opened this fall at the National Air and Space Museum. The two panoramic films—*Grand Canyon: The Hidden Secrets* and *Niagara: Miracles, Myths and Magic*—capture the grandeur of these natural wonders with immediacy and power. In *Grand Canyon*, the human history of the canyon is set against the majesty of its landscape. In *Niagara*, the audience rides with madcap adventurer Annie Taylor in a reenactment of her daring trip over the falls in a barrel, and views details of this national landmark rarely seen.

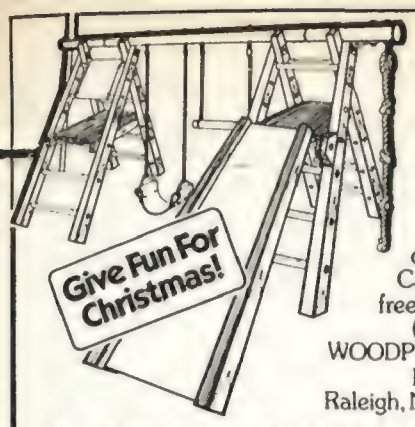
Both features were created and filmed by award-winning director Keith Merrill. *Grand Canyon* was produced in 1984; *Niagara* premiered in May of this year. The double bill will be shown daily at 6:50 P.M. through December.

Planning a Smithsonian visit?

The Associates' Planning Packet, brimming with helpful information, is yours for the asking; call or send postcard to Associates' Reception Center, Smithsonian, Washington, D.C. 20560; (202) 357-2700 or TDD for hearing impaired (202) 357-1729. Begin your visit at the Associates' Reception Desk in the Castle.

Special November exhibits and events

Arthur M. Sackler Gallery
In Praise of Ancestors (through 1988) Extensive collection highlights bronzes, jades.
Monsters, Myths and Minerals (through 1988) Animal imagery in 123 pieces.
Pavilions and Immortal Mountains: Chinese Decorative Art and Painting (through August 1988) Furniture, paintings and precious objects reflecting the taste of Chinese scholar-painters.



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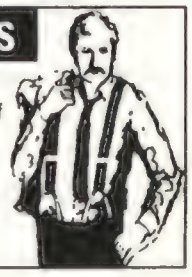

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Nomads and Nobility: Art from the Ancient Near East (through September 1988) Works from Iran, Anatolia, the Caucasus.
Persian and Indian Paintings: Selections from a Recent Acquisition (through February 28) Fifteen masterpieces.

National Museum of African Art
African Art in the Cycle of Life (through March 20) Sub-Saharan masterworks.
Permanent Collection More than 100 classic examples of African art.
Objects of Use (through May 2) Exquisitely crafted utilitarian objects.
Patterns of Life: West African Strip-Weaving Traditions (through February 29) A rich selection of textiles.
Royal Benin Art in the Collection of the National Museum of African Art (indefinite) Traditional court art.

National Air and Space Museum
Women in Helicopter Aviation (November 11-indefinite) Women helicopter pilots and their exploits.
Into the Sunlit Splendor (through February 1988) Forty paintings by aviation artist William S. Phillips.

National Museum of Natural History
Stamps by Arthur B. Singer (November 20-January 30) Fifty paintings of state birds and flowers commissioned for U.S. postal stamp issue by one of America's foremost wildlife artists.
Plains Indian Art, Continuity and Change (through February 22) Work of 12 contemporary artists.

National Museum of American History
The Search for Life: Genetic Technology in the 20th Century (November 11-March 30) Molecular biology—its history and its applications in agriculture and medicine.
A More Perfect Union: Japanese Americans and the U.S. Constitution (indefinite) An examination of the relocation experience.
We the People: Winning the Vote (through 1988) The development of the American political process.

Hirshhorn Museum & Sculpture Garden
A Quiet Revolution: British Sculpture Since 1965 (November 10-January 10) Works by six progressive artists.
Lucian Freud (through November 29) Eighty-one paintings in a major retrospective by the British realist.

Anacostia Museum
Climbing Jacob's Ladder: The Rise of Black Churches in Eastern American Cities, 1740-1877 (through March 20) One hundred fifty illustrations and artifacts.

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National Portrait Gallery
Studies from Life: Portrait Photographs by Julia Margaret Cameron (November 25-February 7) Portraits by the masterful 19th-century photographer.
American Colonial Portraits: 1700-1776 (through January 10) First exhibition on the subject since the 1930s.

National Museum of American Art
American Traditions in Watercolor: The Worcester Art Museum Collection (through November 22) Masters of the medium.

Renwick Gallery
Cynthia Schira: New Work (November 13-February 14) Ten large-scale weavings.
Lost and Found Traditions: Native American Art 1965-1985 (through March 6) An enduring artistic legacy.

Cooper-Hewitt Museum (New York)
Color by the Yard: Printed Fabric 1760-1860 (November 3-March 13) A century in the development of printed fabric; examples from around the world.
Vienna/New York, The Work of Joseph Urban, 1872-1933 (November 17-March 6) Architectural, set and furniture designs.
Surprise! Surprise! Pop-Up and Movable Books (through February 21) Subjects from anatomy to fairy tales.

Exhibition catalogs

Catalogs available at this time include:
Generations: A Universal Family Album (paper, $18.95; cloth, $35)
African Art and the Cycle of Life (paper, $19.95; cloth, $39.95)
Royal Benin Art in the Collection of the National Museum of African Art (paper, $12.95)
Lucian Freud: Paintings (paper, $21.95; cloth, $40)

To order, send check or money order to Museum Shops, Box 44083, Washington, D.C. 20026-0083. Include 15 percent of total purchase to cover postage and handling (minimum, $1.75).

Lecture and Seminar Program

Minneapolis and St. Paul, Minnesota, will host the Program, November 4-8. Smithsonian events will feature lectures, workshops, seminars and films presented by Smithsonian curators and scholars. Topics include American fashion, nature photography, Expressionist art and the fate of the tropical rain forest. For further information, write to the Lecture and Seminar Program, 1100 Jefferson Drive, S.W., Washington, D.C. 20560 or call (202) 357-1350.

Smithsonian on the air

Radio Smithsonian: Features on this weekly half-hour series include the story of the rise of black Christian congregations in eastern American cities, a discussion of genetic technology in the 20th century, and a musical introduction to Folkways Records (SMITHSONIAN, August 1987).
Here at the Smithsonian: Three-minute TV features present a look at the art of John La Farge and an amazing laboratory with a self-contained model of the Earth.

To find out what stations in your area carry these programs, write Office of Telecommunications, MAH Room BB40, Washington, D.C. 20560.

Resident Associate Program

To become a Resident Associate, or for fee and ticket information, call 357-3030. Here are some November events:
Thelonious Monk International Jazz Piano Competition (Preliminaries: November 18, 19; 1 P.M., Finals gala: November 19; 7:30 P.M.) Pianists from all over the world assemble to honor American jazz great.
An Evening with Isaac Stern: A Dialogue with Paul Hume (November 14; 8 P.M.) Violinist meets music critic.
War and Memory: In the Aftermath of Vietnam (Concert: November 13; 7:30 P.M., Symposium: November 14; 3:30 P.M.) Concert with Terry Allen, Joe Ely, Butch Hancock, Jimmie Gilmore; symposium on role of pop music in the war.
Robert Hughes on Lucian Freud (November 16; 8 P.M.) *Time* magazine art critic lectures on renowned British artist.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities outside the Washington area. To sponsor one of the shows in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some November exhibits:
Charleston, West Virginia (November 27-January 10) *Savory Suppers and Fashionable Feasts: Dining in Victorian America*, Sunrise Museums Inc.
District of Columbia (through March 31) *Generations*, International Gallery, S. Dillon Ripley Center (See *Highlights continued*).
Fort Lauderdale (November 14-December 13) *The Grand Generation: Memory, Mastery, Legacy*, Discovery Center.
St. Louis (November 14-December 13) *Haiti: The First Black Republic and Its Monuments to Freedom*, Vaughn Cultural Center.

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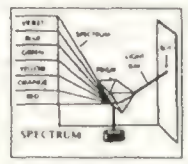

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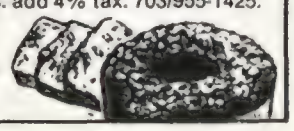

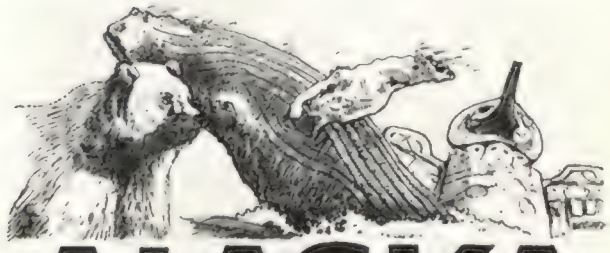

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'Generations': a family album

A new exhibition uses the universal experiences of birth and infancy to show how common links connect all of us

What do cobwebs, old shoes, mistletoe and garlic have to do with new generations? Rosebushes, cabbage patches or storks with birth? How were you anticipated, welcomed, fed, carried, clothed? You'll find out when you see "Generations," the inaugural exhibition of the Smithsonian's new International Gallery.

The exhibit, a multicultural exploration of the arts, lore and rituals associated with birth and infancy through the centuries, was prepared by the Smithsonian Institution Traveling Exhibition Service. The show's 275 artifacts and rich array of photographs represent more than 90 different cultures. On display are objects as diverse as Greek ceramics, Medieval manuscripts, Renaissance anatomical dolls and Chinese fertility figures.

"The exhibition highlights a subject that is at once universal and culture specific," says project director Anna Cohn. "It's about the aspirations each of us holds for new generations and the very real conditions into which they are born."

"Generations" will be on view in the International Gallery of the new Quadrangle complex through March 31, 1988.

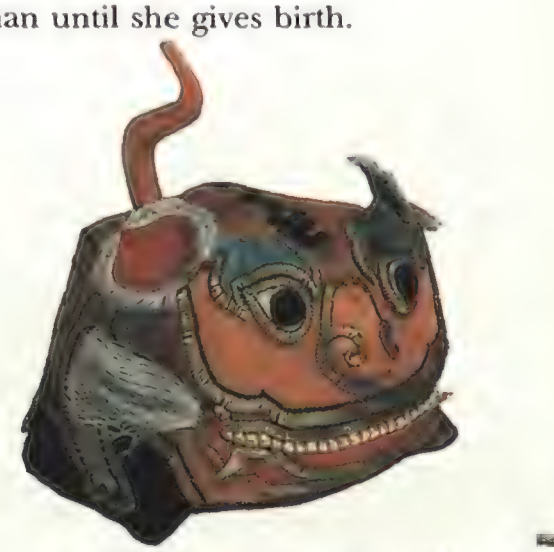
(For those of you thinking about a new generation of your own, be sure to sweep those cobwebs off your bedroom ceiling.)

Diane M. Bolz

Victorian-era French candy container depicts baby emerging from eggshell.

Fertility doll from Kenya, 20th century, is kept by woman until she gives birth.

Kuna Indian mother and child from Colombia wear traditional adornments.



Boy's tiger hat from China, c. 1900, symbolizes protection from supernatural.

English posset pot, 1670-1730, was used for serving warm milk to infants.

Early 19th-century Japanese drum rattle is made of animal skin, wood, metal.

Turkish baby shoes, c. 1885-1929, were important symbol of family's status.

Elaborately beaded cradleboard, c.1876, held infant for Kiowa naming ceremony.

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Domestic Study Tours

Christmas at the Smithsonian December 4-6: Welcome the holidays with tours, music and festive dining. Visit the new Museum of African Art, Haupt Garden and Sackler Gallery after a lecture by architect Jean Paul Carlhian.

Florida Springs February 6-10: Canoe the freshwater springs of central Florida and see the endangered West Indian manatee.

Hawaii February 6-18 or February 20-March 3: Experience undersea wonders, great volcanoes, lush forests and whale watching.

Baja Whale Watch February 22-March 1 or March 1-9: Discover the beauty of Baja California in company of gentle gray whales.

Death Valley & East Mojave Desert March 9-18 or April 8-17: Explore these wilderness areas by van. Visit Scotty's Castle, photograph desert flowers and hike to scenic overlooks.

Sojourn in Tucson April 3-10 or April 25-May 2: From your base at the Arizona Inn, settle in for a week-long overview of Arizona's cultural and natural history.

Alabama April 9-16: Discover the South's rich cultural heritage as interpreted by scholars, craftsmen and musicians.

Southwest Indians April 29-May 8: In this in-depth look at Southwest Indian cultures, travel to Phoenix, Chaco Canyon and Canyon de Chelly. Meet craftsmen, visit museums and private collections.

San Francisco May 14-21: Experience the ambience and charm of this popular destination while visiting sites beyond the usual tourist route. An overview of the city's history, ethnic diversity and future prospects.

Atlantic Quest May 18-June 1: Retrace America's history from Florida to Maine aboard the *Illiria*. This unique voyage begins in New Orleans and includes stops at St. Augustine, Savannah, Charleston, Providence and many other historic ports; tour concludes at Campobello Island in New Brunswick.

Sanibel Island May 22-28 or May 29-June 4: Tidal walks and canoe journeys take you in search of alligators, roseate spoonbills and loggerhead turtles in this estuarine environment on Florida's Gulf Coast.

Spring Gardens Coming in May, a new tour. Enjoy a variety of gardens in Washington, D.C. and the Delaware Valley including the Enid A. Haupt Garden, Longwood and Winterthur.

Washington "Anytime" Weekend Discover your capital city in Smithsonian style with this economical package. Visit the new Quadrangle building complex which contains the recently opened Museum of African Art and Sackler Gallery. Reserve with VISA or MasterCard now.

Foreign Study Tours

People's Republic of China Follow the Silk Road, climb sacred peaks, cruise the Yangtze, travel by train, study decoration and antiques or visit Tibet. Tours for new and repeat China travelers.

Christmas in Europe Celebrate with fellow Associates in one of four idyllic settings: Munich and Rothenburg; Salzburg and Vienna; Canterbury; or Winchester.

Christmas in Fiji December 17-29: Enjoy the holidays in a South Sea island setting. Reside at the intimate Namale Plantation overlooking the Pacific.

Backstage London January 1-10: In Europe's theater capital, attend traditional and avant-garde productions, meet performers backstage.

South America Voyage January 7-31: Cruise from Brazil through the Strait of Magellan and Beagle Channel to Santiago, Chile. Fly to Iguaçu Falls.

Thailand and Burma January 9-29: In Asia's most exotic countries, explore colorful cities, remote villages and archaeological sites.

Mesoamerican Study Programs January and February: Choose from three itineraries —Yucatán Adventure, Zapotec and Maya Mexico, Guatemala Adventure. Explore archaeological treasures, natural beauty.

Tanzania-Kenya Wildlife Safari January 18-February 7: A unique wildlife excursion featuring the best of East Africa.

India Wildlife Safari January 22-February 17: Travel by elephant and jeep to observe rare species of birds and animals in India and southern Nepal.

Siberian Winter Odyssey January 24-February 6: A thrilling winter exploration awaits you—dash through majestic countryside in a troika, ride the Trans-Siberian Express, visit Moscow and Leningrad.

A Hike in New Zealand February 14-March 5: From Lake Te Anau to Milford Sound, discover wildflowers, crystalline lakes and snowcapped peaks on the Milford Track.

Australia-New Zealand February 21-March 15: An intriguing introduction to the natural history and culture of lands "down under."

Costa Rica March 11-24: An expedition for nature enthusiasts to see flora, birds and other wildlife in the American tropics.

Chile-Bolivia Voyage March 24-April 6: Aboard the *Illiria* travel up the coast of Chile to Bolivia. Explore archaeological finds, crystal clear lakes and the magnificent Atacama Desert.

Caribbean Voyage March 28-April 4: Sail from the Panama Canal to Curaçao aboard the four-masted, square-rigged bark *Sea Cloud.* Calls include the San Blas Islands, Cartagena, Aruba.

Berlin April 14-29: Experience the two sides of Berlin, East and West, named Cultural Capital of Europe for 1988.

May in Greece May 6-21: Marvel at classical wonders and beautiful landscape from Athens to Thessaloníki.

Genius of Italy May 10-27: Sail around Italy, from Venice to Genoa, on the *Argonaut.*

European Countryside Programs May-September: Reside in scenic and historic areas of Hungary, England, Austria, France, Switzerland, Germany, Wales or the Netherlands.

Write Smithsonian National Associates, 1100 Jefferson Drive SW, Washington, DC 20560 or call (202) 357-4700 for tour brochures

Washington

Smithsonian Seminars

Washington, D.C.
January 10-15

Expand your educational horizons as you combine a pleasure-filled visit to the nation's capital with stimulating week-long courses of study that highlight Smithsonian museums and research facilities. This winter, Smithsonian scholars will lead three exciting seminars. Discover the Sackler Gallery and the Museum of African Art during lectures and tours. Or, study the fine points of creative writing with a SMITHSONIAN editor.

Splendors of Asian Art

Trace the history of Asian art with scholars from the Sackler and Freer galleries. Enjoy lectures and tours that feature Chinese bronzes, decorative art and painting, Near Eastern metalwork and contemporary Japanese art. You'll also visit private and public collections of Indian and Tibetan art.

African Art at the Smithsonian

Discover Africa's rich artistic heritage as you tour the museum's permanent collection and special exhibitions ranging from West African strip-weaving to the royal art of Benin. Learn about the relationship between African sculpture and the rites of passage. Explore the variety of materials used to create beautiful utilitarian objects.

The Art and Craft of Creative Writing

Study the techniques of successful creative writing with Edwards Park, author of SMITHSONIAN's monthly column *Around the Mall and beyond.* Immerse yourself in the colorful range of activities at the Smithsonian museums and share your written impressions with classmates during daily discussion sessions.

Mohonk Mountain House
March 27-April 1

Spend a delightful week at this magnificent lakeside Victorian resort near New Paltz, New York. Surrounded by thousands of unspoiled, wooded acres, you'll have your choice of three invigorating seminars. Study creative writing with Edwards Park (see above), explore America's artistic traditions with William Kloss during "The New Eden: A Century of American Art," or survey our popular musical heritage with pianist John Eaton during "The Golden Age of Song: American Jazz Favorites."

or (202) 357-1350 for seminar brochures.

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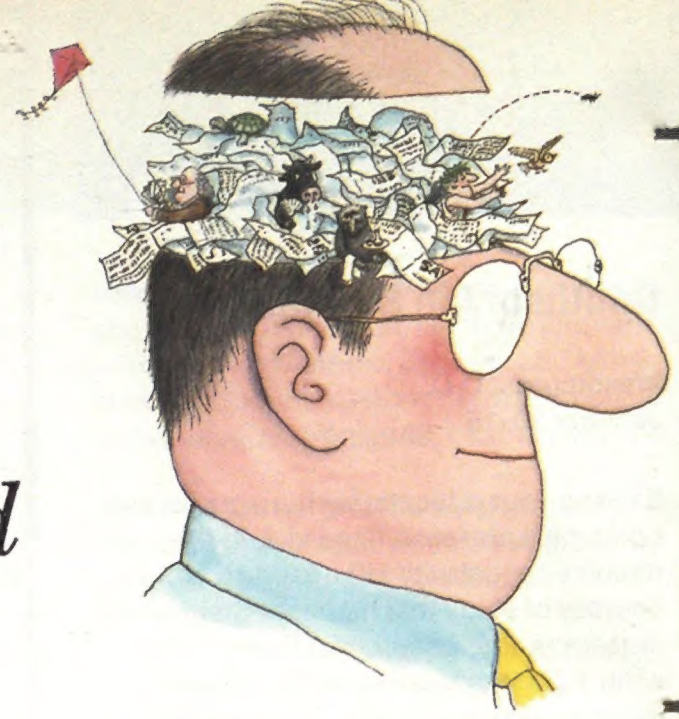

An ode to newspaper fillers, those rich tidbits of the mind

When I was 13 years old, I started a newspaper route. The paper I delivered carried fillers, small factual one-liners that were on the inside pages at the end of a column to fill the void at the end of an article.

I say "were" because fillers are rare now. Mostly they tend to show up in small papers with a circulation of 25,000 or less. Apparently, in this age of news glut and electronic typesetting, there just isn't that much call for them.

But they were common when I was a kid and as I walked my paper route I used to read and memorize as many as I could. "In 1888 Jack the Ripper murdered seven women in London," I would repeat to myself, then move on to "The common flea can jump over 200 times its own length." Or "The average human liver weighs three pounds."

Some were so dramatic that I can call them up verbatim 30 years later. I remember the day I first came upon "A popular method of committing suicide in ancient China was to eat a pound of salt," a filler so stunning it stopped me in my tracks. For a moment I even considered giving up pretzels.

Many fillers are still buried in my brain somewhere, and they pop up, now and then. Not long ago the name Euripides came up and I heard myself repeating: "Euripides was killed when attacked by a pack of hunting dogs."

Fillers still provide me with a certain pedantic pleasure, but it is nothing compared with their importance at age 12 or 13 when, among other things, I knew another boy who collected them too. On the school playground, for the benefit of perplexed or admiring peers, we would stage quick fact fights, a kind of filler *Can You Top This?*, the idea being to lead with an item that the other guy had to equal or better. "Turtles have no teeth," I would blurt out and he would counter with, "Cows have four stomachs."

We had rules. One was no "Franklins." It seemed that a full fifth of the fillers we found had to do with Benjamin Franklin. If it wasn't something he had said it was something he had done—as in, "Ben Franklin was one of the first people to manufacture playing cards in America.' It was just too easy to bluff with phony Franklins, we decided, so they were banned entirely.

There was bluffing of another sort, though. We came up with the devilish concept of "cheaters," totally false fillers made up to sound like the real thing. If other kids were listening, one of us would give a secret signal and we'd be off, starting with something fairly believable like "Hyenas often laugh themselves to death," and building to a level of absurdity, something on the order of "The ancient Sumerians taught oysters to do simple household tasks." The idea was to see how absurd we could get before we were caught. Obviously cheaters couldn't be tried too often.

You also had to be careful not to memorize your cheaters lest one come out at the wrong time. But the other kids didn't know when we started using the bogus items and may have taken them as fact. I'd like to think that they were absorbed, lay dormant and emerged many years later to cause embarrassment in games of Trivial Pursuit.

Over time I noted the decline in the filler and it was not long before I could pick up the morning paper and *not* find word one about Ben Franklin.

Last year, though, a friend gave me a subscription to the Nantucket weekly *Inquirer and Mirror*. It's full of fillers! Reading page 1-C of the issue at my elbow I learn that "People have believed dill would scare away witches." Also that "Ketchup was once sold as a medicine." Page 7-C stunned me with "Back in 400 B.C., a flying wooden pigeon made by Archytas of Tarebtum became the talk of the Old World." I have lately been reminded there are 60,000 miles of blood vessels in the human body, that the common garden snail travels at an average speed of .03 miles per hour and, to quote one of my favorites in its entirety, "In one case on record, strong winds behind a cold front carried spores of a fungus from Minnesota to Georgia in two days."

Curiosity compelled me to check with one of the paper's editors to ask where its fillers come from. Most come out of booklets offered by something called the Barbara Thompson Free Filler Service, a subsidiary of North American Precis Syndicate Inc., in New York. The editor also writes some himself: "Big papers have problems with too much copy, but we're always trying to fill holes."

The Thompson service, it turns out, sends free fillers to more than 3,800 small newspapers. They are free because many items are paid for by clients who want to pass along a message about themselves or their products. The rest are nonsponsored fillers provided as a service to editors and are chosen from an assortment of reference works by a staff of 75 people.

Fortunately, I have run out of things to say about fillers which means the editors of this magazine will have to find a way to fill up the rest of this column. Here are three possibilities:

"Silver Threads Among the Gold" was Billy the Kid's favorite song.

Baboons, according to legend, were trained to wait on tables in ancient Egypt.

Cows sweat through their noses.

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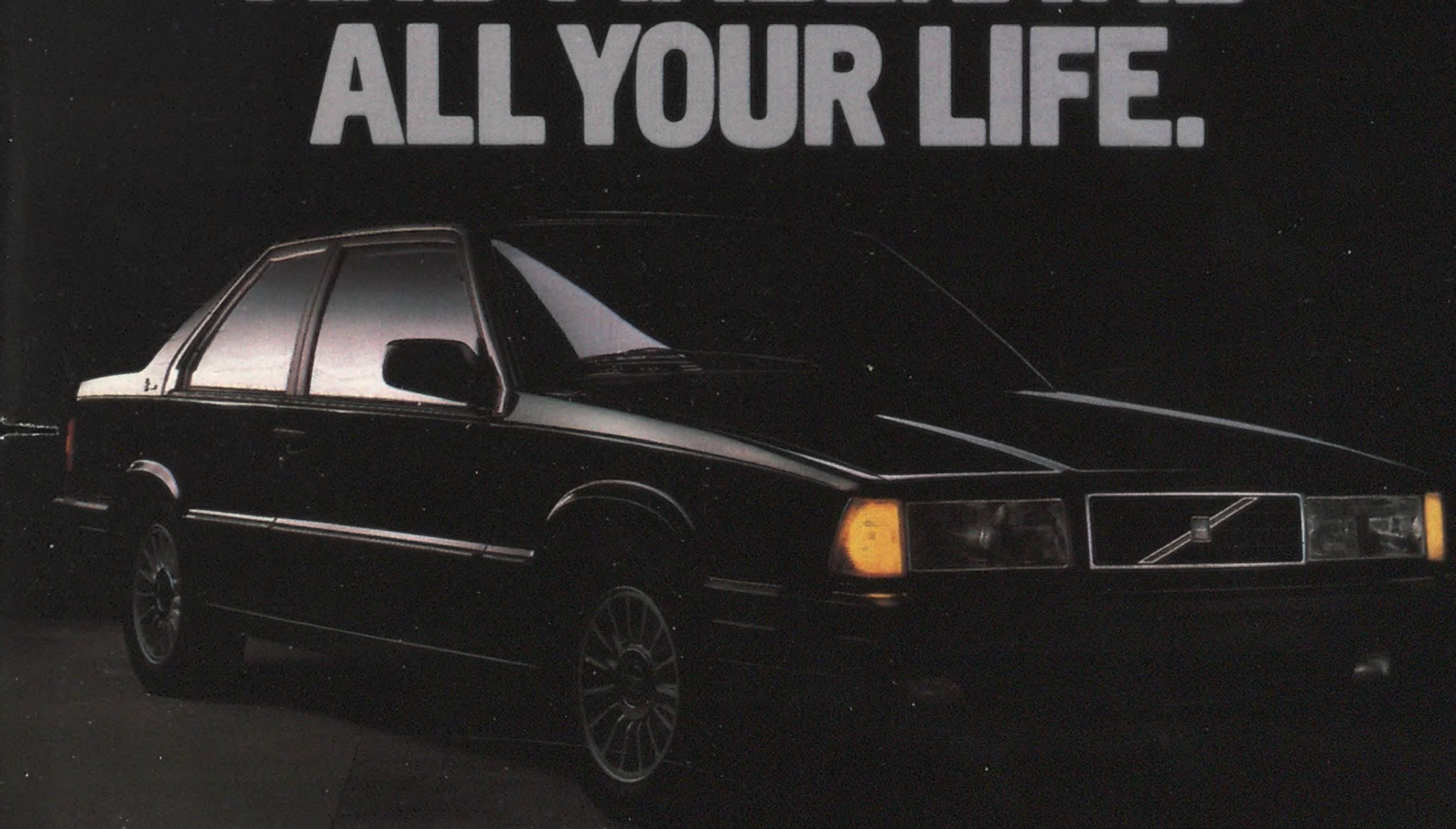

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